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GenCore version 5.1.6
Copyright (c) 1993 -.2003 Compugen Ltd.
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OM protein - protein search, using sw model

December 17, 2003, 22:38:40; Search time 12 Seconds (without alignments) 1779.177 Million cell updates/sec Run on:

Title: Perfect score: Sequence:

US-10-098-602A-2
2376
1 MTITYDELNNLIRNGKIDTV......INBFSKQVTDWELNQFPNRY 454

Scoring table:

BLOSUM62 Gapop 10.0 , Gapext 0.5

127863 seqs, 47026705 residues Searched:

127863 Total number of hits satisfying chosen parameters:

Minimum DB seq length: 0 Maximum DB seq length: 2000000000

Post-processing: Minimum Match 08
Maximum Match 1008
Listing first 45 summaries

SwissProt_41:* Database :

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

		pt	TARENT P3/6205 Thermotoga P	P10656 clostridium	Q9cdl9 lactococcus	P21154 methanococc	P12425 bacillus su	Q59812 staphylococ	Q99ug5 staphylococ		P19064 bacillus ce	O59648 methanococc	Q60182 methanococc	O27612 methanobact	Q10378 mycobacteri	008467 pyrococcus		_		Q9hni2 halobacteri	029313 archaeoglob							P23794 sulfolobus	P77958 streptomyce	4	frankia a	Q10377 mycobacteri	P33035 fremyella d		Oghh09 sulfolobus
SUMMARIES		ΩI	GLNA THEMA	GLNA_CLOSA		1 GLNA METVO	1 GLNA_BACSU	GLNA_STAAW	L GLNA_STAAM	L GLNA_LACDE		L GLNA METMP	L GLNA_METJA	GLNA METTH	L GLN2_MYCTU	GLNA_PYRKO	L GLNA_PYRAB	L GLNA_PYRFU	GLNA_HALVO	CENA_HALN1	GLNA_ARCFU		L GLNA_PYRHO	CGLN3_RHIME	L YCJK_ECOLI	L GLNA_AQUAE	L GLN3_RHILP	L GLNA_SULSO	GLN1_STRRP	GLNA_ANASP		GLN1_MYCTU		GLN1_STRVR	GLNA_SULAC
		Le la	220 2 439	443				446	446	445	443	446	454	442	446	443	439	439	454	454	491	439	443	435	472	469	435	471	469	473	47	4	47	9	473
	* Ouery	Match		19.6	19.5	18.6	18.6	17.9	17.8	17.3	17.3	16.9	16.8	16.6	16.6	16.5	16.4	•	16.3	16.3	16.2	16.1	15.8	٠	٠		٠	٠	•	13.1	13.0	12.8	12:7	12.7	12.6
		Score	480	466	464	443	442.5	424.5	423	_		400.5	398.5	395	393.5	391	389.5	389.5	387.5	386.5	386	381.5	376	353	341	330.5	330	327	312	310.5	308.5	303	302	301	300.5
	Result	No.	п	7	٣	4	Ŋ	9	7	80	σ	10	11	12	13	14	15	16	17	18		20	21	22	23	24	22	56	27	28	29	30	31	32	33

106 streptomyce 605 synechococc	Q59747 rhizobium m P43794 haemophilus	lp2 pasteurella 583 azospirillu	904 vibrio algi 248 azotobacter	126 azornizobiu 845 helicobacte 786 proteus vul
P15:	059°	090 P10	P19	4.00 4.00 4.00 4.00
GLNA_STRCO	GLNI_RHIME GLNA_HAEIN GLNA_METCA	GLNA_PASMU GLNA_AZOBR	GLNA_VIBAL GLNA_AZOVI	GLNA_HELPY GLNA_PROVU
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469	469 472 468	468	468	469 469
12.6	12.1	11.9	11.6	11.3
299 293	287.5 287 287	283 280	278.5	267.5
3.4 3.4	3.6 3.7 8.6	4 3 6	4 4 4 5	4 4 4 5 4 5

ALIGNMENTS

lori-	ALIGNMENIS	RESULT 1 GLNA_THEWA ID GLNA_THEWA STANDARD; PRT; 439 AA.	01-JUN-1994 (Rel. 29, Created)	(Rel.	Glutamine synthetase (EC 6.			OX NCBI_TaxID=2336; RN [1]	SEQUENCE FROM	RC STRAIN=MSB8 / DSM 3109; RX MRDLINE=92225700. DibMsd=1348781.	Sanangelanton	gene of the extremely thermophil	maritima: cloning,	RT coli."; Dr. J Gen Wiczebiel 138.383-303/1902)	[2]		RC STRAIN=MSB8 / DSM 3109;		Nelson W.C., Ke		Heidelberg J., Sutton G.G., Fleischmann R.D., Eisen J	Salzberg S.L., Smith H.O., Venter J.C., Fraser C.M.,	XT "Evidence for lateral gene transfer between Archaea and Bacteria from	geno	- : - CAI	CC L-glutamine. CC -1- SHRINIT- Olicomer of 12 cubunits arranged in the form of two	hexagons (By similarity).	÷.	CC SIMILAKIIY: BELONGS TO THE GLOTAMINE SYNTHEIASE FAMILY.		between the Swiss Institute of Bioinformatics and the EMBI	There are no restriction	modified and this statement is not rem		CC or send an email to license@isb-sib.ch).	EMBL; X60160; CAA42729.1; -	DR EMBL; AE001758; AAD36024.1; DR PTR; R72313; R72313	HSSP;	TIGR; TM09	DR InterPro: IPR001691: GLN synth.	
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                                                                                                                                                                                                                                                                                                                                                              102 BGDPÄYRLRRMMÄKAEQLGYTPYAGPBMBFFILPINEKGEPVPEFLD-----HGGYFDL 155 (24 15) 155 SASGIETFMRSVRNKLBEAGILMEATHPEFLPSQHELNFVPADPLTMADRHIIAKHGVR 234
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  274 ILKHAKALAAVTNPTINSYKRUVPGYBAPVYISWSVGNRSALIRIPKARGKATRLEYRSP 333 324 524 538 344 554 559 353 355 GADLNPYLAFSAIIAAGISGIEEKLELPPPASGNVYN-----DKELPEFPNSLQNATH 407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           334 DPSCNIYLAPAAILAAGLDGIINKIEPPAPVEENIYHMTSERREELNIESLPGSLKEAVE 393
                                                                                                                                                                                                                                                                                                                                  FCSPRVILMQQIERLANLKLKGLFASELEFNLFNETYKSASQKHWKNLKTAQPHHQWMNI 174
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                                                                                                                                                                                                                                  3 ITYDELNNLIRNGKIDTVVLACVDMQGRLMGKRLTGRHFLGLDQKKISISTFVYAVTIE-
                                                                                                                                                                                                           42; Gaps
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Janssen P.J., Jones W.A., Jones D.T., Woods D.R.;
"Molecular analysis and regulation of the glnA gene of the Gram-
positive anaerobe Clostridium acetobutylicum.";
J. Bacteriol. 170:400-408(1988).
-!- CATALYTIC ACTIVITY: ATP + L-glutamate + NH(3) = ADP + phosphate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Clostridium saccharobutylicum.
Bacteria Firmicutes; Clostridia; Clostridiales; Clostridiaceae;
Clostridium:
NCBI_TaxID=169679;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-JUL-1989 (Rel. 11, Created)
01-JUL-1989 (Rel. 11, Last sequence update)
16-0CT-2001 (Rel. 40, Last annotation update)
Glutamine synthetase (RC 6.3.1.2) (Glutamate--ammonia ligase)
                                                                                                                                                                                  DB 1; Length 439;
                                                                                                                                                                                                          73; Mismatches 209; Indels
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                                                                                                                                                          CRC64;
                                                                                                                   A -> G (IN REF. 1).
A -> R (IN REF. 1).
S -> T (IN REF. 1).
W; ABE3E674BD2F2359 C
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                                                                                                                                                                                 Query Match 20.2%; Score 480; Best Local Similarity 29.9%; Pred. No. 1 Matches 138; Conservative 73; Mismatch
InterPro; IPR004809; GlnA.
InterPro; IPR001637; GlnA.adenyltn
Pfam; PP00120; gln-synt; 1.
ProDom; PP00391; gln-synt_N; 1.
ProDom; PP00915; gln-synt_N; 1.
ProDom; PP00915; Gln.synt_C; 1.
IGRFAMM; TIGR00633; GlnA; 1.
PROSITE; PS00180; GLNA_1; 1.
PROSITE; PS00181; GLNA_ATP; 1.
Ligase; Complete proteome. A -> CONFLICT 204 204 A -> CONFLICT 386 386 S -> SEQUENCE 439 AA; 50035 MW; ABE:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           64 AGGGYEISSVDTGYSDCHLCADLNSLHLLPW--SEGAVLAISNPHNFVTSEPLFCSPRVI 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             122 IMQQIERLANLKIKGL----FASELEFNLFNETYKSASQKHWKNLKTAQPHHQMMNISA 176
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             4 TYDELNNLIRNGKIDTVVLACVDMQGRLMGKRLTGRHFLGLDQKKISISTFVYAVTIEGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                          BY ADENYLATION. THE FULLY ADENYLATED ENZYME COMPLEX IS INACTIVE. SUBUNIT: OLIGOMER OF 12 SUBUNITS ARRANGED IN THE FORM OF TWO
CONTROLLED
                                                                                                                   -!- SUBCELLULAR LOCATION: Cytoplasmic.
-!- SIMILARITY: BELONGS TO THE GLUTAMINE SYNTHETASE FAMILY.
-!- CAUTION: Was originally thought to originate from C.acetobutylicum.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KESKMLNKTFGEKLILHYVNAANVEINEFSKQVTDWELNQGFNRY 454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           84; Mismatches 211; Indels-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               392 392 AMP (UNDER CONDITIONS OF A GLUTAMINE) (BY SIMILARITY) 443 AA; 49682 MW; EDE5BF4495151FC CRC64;
ENZYME IS
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Pfam; PF00120; gln-synt; l.
ProDom; PD001057; gln synt_C; l.
TIGRPAMB; TIGR00653; GlnA, l.
PROSITE; PS00180; GLNA, l.
PROSITE; PS00181; GLNA, ATP; l.
PROSITE; PS00181; GLNA, ATP; l.
OF THIS
REGULATION: THE ACTIVITY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             InterPro; IPR001691; GLN synth.
InterPro; IPR004809; GlnA.
InterPro; IPR001637; GlnA_adenyltn.
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Matches 130; Conservative
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us-10-098-602a-2.rsp

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216 KLVVKTIARKHGLHATFMAKPVHGINGSGMHCNMSL-FTEDGANAFADPTGDMGLSDVAH 274
                                             NWIAGLLKYVPEATYFFASYINSYKRLQPLTFAPTKCCWAIDNRTSAFRLCNSKSEGINV 349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1 MIITYDELNNL--IRNGKID-----TVVLACVDMQGRLMGKRLTGRHFLGLDQKK 48
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
STRAINE-DSM 1537 / PS;
MEDLINE-90139872; PubMed=2575777;
Possot O., Sibold L., Aubert J.-P.;
Fossot Government of the glutamine synthetase structural gene, glub, of the archaebacterium Methanococcus voltae.";
Res. Microbiol. 140:355-371(1989).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -!- CATALYTIC ACTIVITY: ATP + L-glutamate + NH(3) = ADP + phosphate
                                                                                                                                                                                                                                                                                                                                                                                                                 01-MAY-1991 (Rel. 18, Created)
1-MAY-1991 (Rel. 18, Last enquence update)
28-FBB-2003 (Rel. 41, Last annotation update)
Glutamine synthetase (EC 6.3.1.2) (Glutamate--ammonia ligase) (GS)
                                                                                                                                                                                                                       403 ONATHLLKESKMLNKTFGEKLILHYVNAANVEINEFSKOVTDWELNQGFNRY 454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               98;
                                                                                                                                                                                                                                              395 HNAVKALPEDTIVTEALGEHVLVNFVEAKRIEWASYAQFVSQWEIDNYLELY

    -!- SUBCELLULAR LOCATION: Cytoplasmic.
    -!- SIMILARITY: BELONGS TO THE GLUTAMINE SYNTHETASE FAMILY.

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Methanococcaceae; Methanococcus.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               18.6%; Score 443; DB 1;
28.7%; Pred. No. 9.6e-28;
ative 73; Mismatches 182;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 InterPro; IPR001691; GLN synth.
InterPro; IPR004809; GlnÄ.
InterPro; IPR001637; GlnÄ adenyltn.
Přam; PP00120; Gln-synt; I.
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Pfam; PP00120; gln-synt, N; 1.
Pfam; PP001057; Gln-synt_C; 1.
ProDom; PD001057; Gln-synt_C; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PROSITE; PS00180; GLNA 1; 1.
PROSITE; PS00181; GLNA ATP; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EMBL; X53509; CAA37585.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                           STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Methanococcus voltae.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PIR; A43995; A43995.
HSSP; P06201; 1LGR.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        il'Similarity
142; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NCBI_TaxID=2188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          L-glutamine
                                                                                                                                                                                                                                                                                                                                                                        GLNA METVO
                                             290 1
                                                                                                                                 350
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation-the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (see http://www.isb-sib.ch/announce/or send an email to license@ib-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           113 PLFCSPRVILMOQIERLANLKLKGL-FASELEFNLF--NETYKSASOKHWKNLKTAQPHH 169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       230 KHGVREMAEQSGMVATFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLAR 289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1 MTITYDELNNLIRNGKIDTVVLACVDMQGRLMGKRL--TGRHFLGLDQKKISISTFVYAV 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              26
                                                                                                                                                                                                                                                                           STRAINSILIA03;
MEDLINE=21255186; PubWed=11337471;
MEDLINE=21255186; PubWed=11337471;
MEDLINE=21255186; PubWed=11337471;
MEDLINE=21255186; PubWed=11337471;
Weissenbach J., Ehrlich S.D., Sorokin A.;
"The complete genome sequence of the lactic acid bacterium Lactococcus lactis spp. lactis ILI403.";
Genome Res. 11:731-753[2001].
-!- CATALYTIC ACTIVITY: ATP + L-glutamate + NH(3) = ADP + phosphate +
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TIEGIAGGGYEISSVDTGYSDCHLCADLNSLHLLPWSE-----GAVLAISNPHNFVTSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  170 QWMNISASSGIETFWRSVRNKLEEAGILMEATHPEFLPSQHELNFVPADPLTMADRHIIA
                                                                                                                                                                       Lactococcus lactis (subsp. lactis) (Streptococcus lactis).
Bacteria; Firmicutes; Lactobacillales; Streptococcaceae; Lactococcus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -!- ENZYME REGULATION: DOES NOT SEEM TO BE REGULATED BY ADENYLATION.
-!- SUBUNIT: Oligomer of 12 subunits arranged in the form of two hexagons (By similarity).
-!- SUBCELLULAR LOCATION: Cytoplasmic.
-!- SIMILARITY: BELONGS TO THE GLUTAMINE SYNTHETASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      44;
                                                 28-FEB-2003 (Rel. 41, Created)
28-FEB-2003 (Rel. 41, Last sequence update)
28-FEB-2003 (Rel. 41, Last annotation update)
Glutamine synthetase (EC 6.3.1.2) (Glutamate--ammonia ligase).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 1; Length 446;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     211; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 446 AA; 49693 MW; COA953D5341AD5CF CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2e-29;
                      446 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     80; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          19.5%; Score 464; 29.0%; Pred. No. 26
                      PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HSSP; P06201; 1LGR.
InterPro; 1PR001631; GLN synth.
InterPro; 1PR004809; GlnA.
InterPro; IPR001637; GlnA_adenyltn.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Pfam, PF00120; gln-synt; I.
Probom; PD001057; Gln synt_C; I.
Probom; PTGRPAMS; TIGR00653; Gln Synt_C; I.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL; AE006449; AAK06298.1; -.
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PROSITE; PS00181; GLNA_ATP; 1.
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                      STANDARD;
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                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                     NCBI_TaxID=1360;
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                      LACLA
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                      GLNA LAC
Q9CDL9;
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Best Local Similarity 28.2
Matches 134; Conservative
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VARIANT
 :|||
|-----SIEGF-----VBIEDSDMVLKPDLSTLSVLPWRPSEKSVARIICDV 102
                                                                   103 YRKNGKPF-EGDPRGCLKRV-----LAEFKEEFKGBYFVGPEPEFFILKNENGK--- 150
                                                                                                                  --------WVPGDDAGYFELEPLDEGNDLRRNIVFALENLGFHVEASHHEVAP 195
                                                                                                                                                       196 GQHEVDFKYDNAVKTADSVITFKTTIKTLAKQSGVLATFMPKPFFGMNGSGM-CNQSIWL 255
                                                                                                                                                                                                                                      327 CWAIDNRTSAFRLCNSKSEGINVELRIGGADLNPYLAFSAIIAAGISGIEEKLELPPPAS 386
                                                                                                                                                                                                                                                                                    GNVY-----NDKELPEFPNSLQNATHLLKESKMLNKTFGEKLILHYVNAANVEINEFS 439
                                                                                                                                                                                                                                                                                                 ISISTFVYAVTIEGIAGGGYEISSVDTGYSDCHLCADLNSLHLLPW--SEGAVLAI---- 102
                                                                                                                                          208 SQHELNFVPADPLTMADRHIIAKHGVREMAEQSGMVATFMAKLSSTALGNACHIHMSL-Q 266
                                                                                                                                                                                         DAETEKNAFYDQNDEYGMSTLARNWIAGLLKYVPEATYFFASYINSYKRLQPLTFAPTKC 326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "Sequence of the Bacillus subtilis glutamine synthetase gene region.";
Gene 71:257-265(1988).
                                             --SNPHNFVTSEPLFCSPRVILMQQIERLANLK--LKGLF--ASELBFNLF-NETYKSAS
                                                                                                                                                                                                                                                    QKHWKNLKTAQPHHQWMNISASSGIE-----TFMRSVRNKLEEAGILMEATHPEFLP
                                                                                                                                                                                                     DG---KPSFYDENNAHQLSDICLSYIGGILEHTKALVSVTNPTVNSYKRLVPGYEAPVNI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Kunst F., Ogasawara N., Moszer I., Albertini A.M., Alloni G.,
Azevedo V., Bertero M.G., Bessieres P., Bolotin A., Borchert S.,
Borriss R., Boursier L., Brans A., Braun M., Brignell S.C., Bron S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Nakano Y., Tanaka E., Kato C., Kimura K., Horikoshi K.;
"The complete nucleotide sequence of the glutamine synthetase
(glna) of Bacillus subtilis.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                  01-NOV-1995 (Rel. 32, Last sequence update)
28-FEB-2003 (Rel. 41, Last annotation update)
Glutamine synthetase (EC 6.3.1.2) (Glutamate--ammonia ligase)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Borchert S., Klein C., Piksa B., Hammelmann M., Entian K.D.; "Sequencing of a 26 kb region of the Bacillus subtilis genome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Bacteria, Firmicutes, Bacillales, Bacillaceae, Bacillus.
NCBI_TaxID=1423;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Strauch M.A., Aronson A.I., Brown S.W., Schreier H.J.,
                                                                                                                                                                                                                                                                                                                                                                                                                    443 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A., AND SEQUENCE OF 1-20.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FEMS Microbiol. Lett. 48:81-86(1989)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE=98044033; PubMed=9384377;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
MEDLINE=89138001; Pubmed=2906311;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE=89232679; PubMed=2565853;
                                                                                                                                                                                                                                                                                                                                                                                                                                       01-OCT-1989 (Rel. 12, Created)
01-NOV-1995 (Rel. 32, Last seq
28-FEB-2003 (Rel. 41, Last ann
                                                                                                                                                                                                                                                                                                                                   454
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433 TAVTDWE----FNKY 443
                                                                                                                                                                                                                                                                                                                                 440 KOVTDWELNQGFNRY
                                                                                                                                                                                                                                                                                                                                                                                                                  STANDARD;
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Submitted (FEB-1997)
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P12425;
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Brouillet S., Bruschi C.V., Caldwell B., Capuano V., Carter N.M., RA Choi S.K., Codani J.J., Connerton I.F., Cummings N.J., Daniel R.A., RA Denizot F., Devine K.M., Dusterhoft A., Ehrlich S.D., Emmerson P.T., RA Entian K.D., Erington J., Fabret C., Ferrari E., Foulger D., RA Entian K.D., Erington J., Fabret C., Ferrari E., Foulger D., RA Glim S.Y., Glaser P., Goffeau A., Golightly E.J., Grandi G., Glim S.Y., Glaser P., Goffeau K., Halech J., Harwood C.R., Henaut A., Hilbert H., Holsappel S., Hosono S., Hullo M.F., Itaya M., Jones L., Arzmandta D., Kasahara Y., Klaerr-Blanchard M., Klein C., RA Kuria K., Levine A., Lardinois S., Ruber J., Lazarevic V., Levine A., Lardinois S., Mauel C., Medigue C., RA Medina N., Mellado R.P., Mizuno M., Moestl D., Nakai S., Noback M., Rancone D., O'Reilly M., Ogawa K., Ogiwara A., Oudega B., Park S.H., RA Presecan E., Pujic P., Purnelle B., Rapoport G., Rey M., Reynolds S., Raeger M., Rivolta C., Rocha E., Roche B., Rose M., Sadaie Y., RA Sator T., Scanlan E., Schleib B., Rapoport G., Shin B.S., Soldo B., Schiguchi J., Sekowska A., Seror S.J., Serror P., Shin B.S., Soldo B., Vlari A., Wambutt R., Wedler E., Wedler H., Weitzenegger T., RA Takeuchi M., Tamakaot M., Yanner F., Vasasarotti A., Tosato V., Uchiyama S., Vandenbol M., Vannier F., Vasasarotti A., Yania A., Yoshikawa H.F., Zumatein E., Yoshikawa H., Danchin A., Yoshikawa H., Zumetein E., Voshikawa H., Danchin R., Yoshikawa H., Zumetein E., Voshikawa H., Danchin Bacillus R., Wanter S., Shin B.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CATALYTIC ACTIVITY: ATP + L-glutamate + NH(3) = ADP + phosphate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61;
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-!- SIMILARITY: BELONGS TO THE GLUTAMINE SYNTHETASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -!- ENZYME REGULATION: NOT REGULATED BY POST-TRANSLATIONAL
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STRAIN PCI219).
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-> D (IN STRAIN PCI219)
-> Y (IN STRAIN PCI219)
E2A82D97F3C2D310 CRC64;
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Pred. No. 1e-27;
1; Mismatches 200;
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COEC
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PROSITE; PS00181; GLNA ATP; 1.
PROSITE; PS00182; GLNA ADENYLATION; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                InterPro; IPR001691; GLN synth.
InterPro; IPR004809; GlnÄ.
InterPro; IPR001637; GlnA_adenyltn.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pfam; PF00120; gln-synt; I.
Pfam; PF00351; gln-synt, N. 1.
ProDom; PD001057; Gln synt C. 1.
TIGRPAMS; TIGR00653; GlnA; I.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  81;
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EMBL; D00854; BAA00730.1; -.
EMBL; U66480; AAB41080.1; -.
EMBL; Z99113; CAB13630.1; -.
PIK; JT0392; AJBSQS.
HSSP; P06201; 1LGR.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         50147 MW;
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28.2%;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Nature 390:249-256(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SubtiList, BG10425; glnA.
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This SWISS-PROT entry is copyright. It is produced through a collaboration
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                                                                                                                                            99 -DGTPFEGDPRNNLKRILKEMEDLGFSDFNLGPEPEFFLFKLDEKGE-----PTLEL 149
                                                                                                                                                                                        225
                                                                                                                                                                                                                       209
                                                                                                                                                                                                                                                       285
                                                                                                                                                                                                                                                                                      267
                                                                                                                                                                                                                                                                                                                                                   327
                                                                                                                                                                                                                                                                                                                                                                                                                387
                                                            55 VYAVTIEGIAGGGYEISSVDTGYSDCHLCADLNSLHLLPWS--EGAVLA----ISNPHNF 108
                                                                                                                                                                                                                                                                                                                  286 TLARNWIAGLLKYVPEATYFFASYINSYKRLQPLTFAPTKCCWAIDNRTSAFRLCNSKSE 345
                                                                                                                                                                                                                                                                                                                                                                                 GINVELRIGGADLNPYLAFSAIIAAGISGIEEKLELPPPASGNVY-----NDKELPEF 398
                                                                                            98
 54
                                                                                                                                                                                                            4 TREDIEKLVKEENVKYIRLQFTDILGTIKNVEIPVSQLGK-----ALDNK-----
                                                                                         49 ---VMFDGSSIEGF----VRIEESDMYLYPDLNTFVIFPWTAEKGKVARFICDIYNP---
                                                                                                                        109 VTSEPLFCSPRVILMQQIERLANLKLKGL-FASELEFNLFNETYKSASQKHWKNLKTAQP
                                                                                                                                                                                        HHQ--WMNISASSGIETFMRSVRNXLEEAGILMEATHPEFLPSQHELNFVPADPLTMADR
TYDELNNLIRNGKI DTVVLACVDMQGRL------MGKRLTGRHFLGLDQKKISISTF
                                                                                                                                                                                                                                                     HIIAKHGVREMAEQSGMVATFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMS
                                                                                                                                                                                                                                                                                                                                                                                                                                               454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Microb. Drug Resist. 2:201-207(1996).
-!- CATALYTIC ACTIVITY: ATP + L-glutamate + NH(3) = ADP + phosphate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Stranden A.M., .Roos M., Berger-Bachi B.; "Glutamine synthetase and heteroresistance in methicillin-resistant Staphylococcus aureus.";
                                                                                                                                                                                                                                                                                                                                                                                                                                              PNSLONATHLLKESKMLNKTFGEKLILHYVNAANVEINEFSKOVTDWELNOGFNRY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                | :| | ::: | || || ::: | PATLAEALEEPKSNEVWYXALGEHLFEHFIEAKEIEWDMFRTQVHPWEREQYMSQY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (SS)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MEDLINE=22040717; PubMed=12044378;
Baba T., Takeuchi F., Kuroda M., Yuzawa H., Aoki K.-I., Oguchi Magai Y., Iwama N., Asano K., Naimi T., Kuroda H., Cui L., Yamamoco K., Hiramatus K.;
"Genome and virulence determinants of high virulence community-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       01-NOV-1997 (Rel. 35, Created)
01-NOV-1997 (Rel. 35, Last sequence update)
28-FEB-2003 (Rel. 41, Last annotation update)
Glutamine synthetase (EC 6.3.1.2) (Glutamate--ammonia ligase)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SUBUNIT: Oligomer of 12 subunits arranged in the form of hexagons (By similarity). SUBCELLUIAR LOCATION: Cytoplasmic. SIMILARITY: BELONGS TO THE GLUTAMINE SYNTHETASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Staphylococcus aureus.
Bacteria, Firmicutes; Bacillales; Staphylococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            446 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Staphylococcus aureus (strain MW2), and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A.
STRAIN=BB270 / AS63;
MEDLINE=97302513; Pubmed=9158760;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Lancet 359:1819-1827(2002)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NCBI_TaxID=196620, 1280;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           L-glutamine.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GLNA OR MW1192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              acquired MRSA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GLNA STAAW
059812;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  112 ANLKRVLKEMEDLGFTDFNLGPEPEFFLFKLDEK------GEPTLELNDDGGYF 159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  277
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61 GP------VRIEESDMYLHPDLDTWVIFPWTAGQGKVARLICDVYKTDGTPFEGDPR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 120 VILMQQIERLANLKLKGL-FASELEFNLFNETYKSASQKHWKNLKTAQPHHQ-----wm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DLAPTDLGENCRRDIVLELEDMGFDIEASHHEVAPGQHEIDFKYADAVTACDNIQTFKLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2 TITYDELNNLIRNGKIDTVVLACVDMQGRLMGKRLTGRHFLGLDQKKISISTFVYAVTIE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                62 GIAGGGYEISSVDTGYSDCHLCADLNSLHLLPWS--EGAVLAISNPHNFVTSEPLFCSPR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  173 NISASSGIETFMRSVRNKLEEAGILMEATHPEFLPSQHELNFVPADPLTMADRHIIAKHG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VREMAEQSGMVATFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLARNWI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      293 AGLLKYVPEATYFFASYINSYKRLQPLTFAPTKCCWAIDNRTSAFRLCNSKSEGINVELR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  353 IGGADLNPYLAFSAIIAAGISGIEEKLELPPPASGNVY--NDKE-----LPEFPNSLQNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          28-FEB-2003 (Rel. 41, Created)
28-FEB-2003 (Rel. 41, Last sequence update)
Glutamine synthetase (EC 6.3.1.2) (Glutamate--ammonia ligase) (GS)
GLNA OR SAV1310 OR SA1150.
                                                                                                                                                                                                                                                                                                                                                                                                                  43;
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                                                                                                                                                                                                                                                                                                                                                                                   Length 446;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    406 THLLKESKMLNKTFGEKLILHYVNAANVEINEFSKQVTDWELNQGFNRY
                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                 446 AA; 50840 MW; 81713EE654D7E7E6 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Staphylococcus aureus (strain Mu50 / ATCC 700699),
Staphylococcus aureus (strain N315).
Bacteria; Firmicutes; Bacillales; Staphylococcus.
NCBI_TaxID=158878, 158879;
                                                                                                                                                                                                                                                                                                                                                                                17.9%; Score 424.5; DB 1;
26.2%; Pred. No. 2.9e-26;
tive 92; Mismatches 211;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      446 AA
                                                                                                                       EMBL, AFOULCE, EMBL, TX6490; CAA54030.1; -.
EMBL, TX1840; T51803.
HSSP, P06201; 1LGR.
INTERPRO; IPR001661; GLN synth.
InterPro; IPR001691; GLN.
InterPro; IPR001637; GlnA.
                                                                                                                                                                                                                              Pfam; PF00120; gln-synt, I.
Pfam; PF00150; gln-synt, N; 1.
ProDom; PD001057; Gln synt, C; 1.
IIGREAMs; IIGR00653; GlnA; I.
                                                                                                                 EMBL; AP004826; BAB95057.1; -.
                                                                                                                                                                                                                                                                                                 PROSITE; PS00180; GLNA_1; 1.
PROSITE; PS00181; GLNA_ATP; 1.
                                                                                                                                                                                                                                                                                                                                 Complete proteome
                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
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                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
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Q99UG5;
                                                                                                                                                                                                                                                                                                                                   Ligase; Co
SEQUENCE
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Best Local S
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    104 TPPEGDPRNNLKKVIAEMEEMGFSDFEIGFEAFFLFKB-----GKNGEETTKVSDHSS 157
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       171 WANISASSGIETFMRSVRNKLEEAGILMEATHPEFLPSQHELNFVPADPLTMADRHIIAK 230
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE=93073924; PubMed=1359838; Ishino Y., Morgenthaler P., Hottinger H., Soell D.; Ishino Y., Morgenthaler P., Hottinger H., Soell D.; Organization and nucleotide sequence of the glutamine synthetase (glnA) gene from Lactobacillus delbrueckii subsp. bulgaricus."; Appl. Environ. Microbiol. 58:3165-3169(1992).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -1. ENYTHE RECULATION: DOES NOT SEEM TO BE REGULATED BY ADENYLATI
-1. SUBUNIT: Oligomer of 12 subunits arranged in the form of two
hexagons (By similarity).
                                                                                                                                                                                                                                                                                          01-NOV-1995 (Rel. 32, Last sequence update)
28-FEB-2003 (Rel. 41, Last annotation update)
Glutamine synthetase (EC 6.3.1.2) (Glutamate--ammonia ligase).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 445;

    -!- SUBCĒLLULAR LOCATION: Čytoplasmic.
    -!- SIMILARITY: BELONGS TO THE GLUTAMINE SYNTHETASE FAMILY.

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ; Score 412; DB 1; Length 445; Pred. No. 2.8e-25; 84; Mismatches 203; Indels
                                                                                                                                                                                                                                                                                                                                                                                                       Lactobacillus delbrueckii (subsp. bulgaricus).
Bacteria; Firmicutes; Lactobacillales; Lactobacillaceae;
Lactobacillus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            445 AA; 50133 MW; A57A9E11ABAF87E8 CRC64;
                              422 KLILHYVNAANVEINEPSKQVTDWELNQGFNRY 454
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InterPro; IPR004809; GlnA.
InterPro; IPR001697; GlnA adenyltn.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Pfam; PP00120; gln-synt; I.
Pfam; PP03951; gln-synt_N; 1.
ProcDom; PD001057; Gln synt_C; 1.
TIGRFAMS; TIGR00653; GlnA; 1.
PROSITE; PS00180; GLNA_1; 1.
PROSITE; PS00181; GLNA_1; 1.
                                                                                                                                                                                                                                                     01-NOV-1995 (Rel. 32, Created)
01-NOV-1995 (Rel. 32, Last seq
28-FEB-2003 (Rel. 41, Last anno
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Best Local Similarity 28.3%
Matches 133, Conservative
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          HSSP; P06201; 1LGR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NCBI_TaxID=1585;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    L-glutamine
                                                                                                                                                                                                           GLNA LACDE
P45627;
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SEQUENCE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SDCHLCADLNSLHLLPWS--EGAVLAISNPHNFVTSEPLFCSPRVILMQQIERLANLKLK 135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     128 DFNLGPEPEFFLFKLDEK------GEPTLELNDDGGYFDLAPTDLGENCRRDIV 175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLARNWIAGLLKYVPEATYFFAS 308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   309 YINSYKRLQPLTFAPTKCCWAIDNRTSAFRLCNSKSEGINVELRIGGADLNPYLAFSAII 368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | | : | | : : | : : | : | | EAGLDGIKNKLKVPEPVNQNIYEMREREAVGIQDLPSTLYTALKAMRENEVIKKALGN 413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LVNSYKRLVPGYEAPCYIAWSGKNRSPLIRVPSSRGLSTRIEVRSVDPAANPYMALAAIL 353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        369 AAGISGIEEKLELPPPASGNVY--NDKE-----LPEFPNSLONATHLLKESKMLNKTFGE 421
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 189 NKLEEAGILMEATHPEFLPSQHELNFVPADPLTMADRHIIAKHGVREMAEQSGMVATFMA
                                                                                                                                                                                                                                                                                                                                                                                  Lancet 357:1225-1240(2001).
-!- CATALYTIC ACTIVITY: ATP + L-glutamate + NH(3) = ADP + phosphate
               SEQUENCE FROM N.A.
STRAIN-MUSO / ATCC 700699, and N315,
MEDLINE=21311952; PubMed=11418146;
Kuroda M., Ohta T., Uchiyama I., Baba T., Yuzawa H., Kobayashi I.,
Kunamori M., Matsumaru H., Maruyama A., Murakami H., Hosoyama A.,
Mizutani-Ui Y., Takahashi N.K., Sawano T., Inoue R.-I., Kaito C.,
Sekimizu K., Hirakawa H., Kuhara S., Goto S., Yabuzaki J.,
Kanehisa M., Yamashita A., Oshima K., Furuya K., Yoshino C., Shiba J.
Hattori M., Ogasawara N., Hayashi H., Hiramatsu K.;
"Whole genome sequencing of meticillin-resistant Staphylococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -!- SUBUNIT: Oligomer of 12 subunits arranged in the form of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 446;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  hexagons (By similarity).
-!- SUBCELLULAR LOCATION: Cytoplasmic.
-!- SIMILARITY: BELONGS TO THE GLUTAMINE SYNTHETASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          17.8%; Score 423; DB 1; Length 44 ilarity 28.5%; Pred. No. 3.8e-26; Conservative 82; Mismatches 169; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Pfam; PF00120; gln-synt; T.
Pfam; PF0391; gln-synt, N; 1.
Pr000m; PD001057; gln synt, N; 1.
TIGRFAMs; TTGR00653; GlnA; 1.
PROSITE; PS00180; GLNA_1; 1.
PROSITE; PS00181; GLNA_ATP; 1.
Ligase; Complete proteome.
SEQUENCE 446 AA; 50854 MW; FF9F25631167903D CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           HSSP; P06201; 1LGR.
InterPro; IPR001691; GLN_synth.
InterPro; IPR004809; GlnA.
InterPro; IPR001697; GlnA_adenyltn.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EMBL; AP003361; BAB57472.1; -. EMBL; AP003133; BAB42404.1; -.
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PIR; H89905; H89905.
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Matches 112; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                               L-glutamine.
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ADENYLATION

103

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                      217
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                                                                                                                                                                                                    FLNGILEHARAITCVANPTVNSYKRLIPGFEAPVYISWASRNRSPMVRIPNANBVGTRLE
                                                 HGVREMAEQSGMVATFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLARN
                                                                                                                 WIAGLLKYVPEATYFFASYINSYKRLQPLTFAPTKCCWAIDNRTSAFRLCNSKSEGINVE
                                                                                                                                                                                 LRIGGADLNPYLAFSAIIAAGISGIEE-KLELPPPASGNVY--NDKELPE-----FPNSL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Nakano Y., Kato C., Tanaka E., Kimura K., Horikoshi K.;
"Nucleotide sequence of the glutamine synthetase gene (glnA) and its
upstream region from Bacillus cereus.";
J. Bacohem..106:209-215(1989).
-!- CATALYTIC ACTIVITY: ATP + L-glutamate + NH(3) = ADP + phosphate
                                                                                                                                                                                                                                                  452
                                                                                                                                                                                                                                                                    01-NOV-1995 (Rel. 32, Last sequence update)
15-DEC-1998 (Rel. 37, Last annotation update)
Glutamine synthetase (EC 6.3.1.2) (Glutamate--ammonia ligase)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MODIFICATION AND NOT SUBJECT TO FEEDBACK INHIBITION. SUBUNIT: OLIGOMER OF 12 SUBUNITS ARRANGED IN THE FORM OF
                                                                                                                                                                                                                                              ONATHLLKESKMLNKTFGEKLILHYVNAANVEINEFSKOVTDWELNOGFN

    SUBCELLULAR LOCATION: Cytoplasmic.
    SIMILARITY: BELONGS TO THE GLUTAMINE SYNTHETASE FAMILY.

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ENZYME REGULATION: NOT REGULATED BY POST-TRANSLATIONAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Firmicutes; Bacillales; Bacillaceae; Bacillus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           443 AA; 50064 MW; 14A9EAB948BE0657 CRC64;
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InterPro: IPR001691; GLN synth.
InterPro: IPR001691; GLN admit InterPro: IPR001691; GLN admit InterPro: IPR001691; GLN admit InterPro: IPR001637; GLN admit InterPro: IPR001637; GLN synt.; I.
ProDom; P0001057; GLN synt. I.
PROSITE; PS001081; GLNA - I; I.
PROSITE; PS001081; GLNA ATP; I.
PROSITE; PS001081; GLNA ATP; I.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STRAIN=IFO 3131;
MEDLINE=90036764; Pubmed=2572584;
                                                                                                                                                                                                                                                                                                                                                                                             01-NOV-1990 (Rel. 16, Created)
01-NOV-1995 (Rel. 32, Last seq
15-DEC-1998 (Rel. 37, Last ann
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                                                                                                                                                                                                                                                                                                                                                                STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NCBI_TaxID=1396;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Bacillus cereus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -glutamine
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SEQUENCE
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                                                                                                                                            63 IAGGGYEISSVDTGYSDCHLCADLNSLHLLPWS--EGAVLAISNPHNFVTSEPLFCSPRV 120
                                                                                                                                                                  F-----VRIEESDMYLYPDLDTWVIFPWTAEKGKVARLICDIYNADGTPFEGDPRN 109
                                                                                                                                                                                                                                                                                                                                                                  231 HGVREMAEQSGMVATFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLARN 290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LRIGGADLNPYLAFSAIIAAGISGIEEKLELPPPASGNVY-----NDKELPEFPNSLQ 403
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  333 VRSVDPAANPYLVMATLLAAGLDGIKNKLTPPAAVDRNIYVMTKEEREEAGIVDLPATLA 392
                                                                                                          58
                                                                                                                                                                                                                                                       110 NLKRVLKEMEALGFSDFNLGPEPFFLF------KVDEKGNPTLELNDNGG
                                                                                                                                                                                                                                                                                                              4 TYDELNNLIRNGKIDTVVLACVDMQGRLMGKRL-TGRHFLGLDQKKISISTFVYAVTIEG
                                                                                                          4 TKEDIFRLAKEENVKYIRLQFTDLLGVIKNVEIPVSQLTKALDNKAMFDGS----SIEG
                                                                                                                                                                                                                     121 ILMQQIERLANLKLKGL-FASELEFNLFNETYKSASQKHWKNLKTAQPHHQWMNISASSG
                                                                                                                                                                                                                                                                                           180 I------ETFMRSVRNKLEEAGILMEATHPEFLPSQHELNFVPADPLTMADRHIIAK
                                                                                                                                                                                                                                                                                                                                                                                                                                         291 WIAGLLKYVPEATYFFASYINSYKRLQPLTFAPTKCCWAIDNRTSAFRLCNSKSEGINVE
                                     Gaps
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              393 QALVTLQSNEVISNALGDHLLEHFIEAKEFEWDIFRTQVHQWERDQYMSLY 443
                                   51;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Last sequence update)
Last annotation update)
(EC 6.3.1.2) (Glutamate--ammonia ligase)
 Length 443;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Cohen-Kupiec R., Marx C.J., Leigh J.A.; "Function and regulation of glnA in the methanogenic archaeon Methanococcus maripaludis.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       404 NATHLLKESKMLNKTFGEKLILHYVNAANVEINEFSKQVTDWELNQGFNRY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -1- SUBCELLULAR LOCATION: Cytoplasmic (Potential).
                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Methanococcus maripaludis.
Archaea; Buryarchaeota; Methanococci; Methanococcales;
Methanococcacea; Methanococcus.
NCBI_TaxID=39152;
17.3%; Score 411.5; DB 1;
26.8%; Pred. No. 3.1e-25;
ive 82; Mismatches 212;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  J. Bacteriol. 181:256-261(1999).
-!- CATALYTIC ACTIVITY: ATP + L-glutamate + NH(3)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MEDLINE=99084965; PubMed=9864338;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     15-DEC-1998 (Rel. 37, Created)
15-DEC-1998 (Rel. 37, Last seq
30-MAY-2000 (Rel. 39, Last and
Glutamine synthetase (EC 6.3.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL; AF062391; AAD04845.1; -.
                            Matches 126; Conservative
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                  Similarity
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059648;
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Query Match
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   118 PRSRLKAILEELKK-EMNGEYFVGPEPEFFLLKR--------DPHNPHRWVP 160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             HIIAKHGVREMAEQSGMVATFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEY-GM 284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  221 VITEKWTIKNIAKKHGLKATEMPKPFFGMNGNGMHCHQSVW--FNGEPSFYDPEGPYNGL 278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STLARNWIAGLLKYVPEATYFFASYINSYKRLOPLTFAPTKCCWAIDNRTSAFRLCNSKS 344
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       279 SETCLSYIAGILSHAKALVAITNPTVNSYKRLVÞGYEAÞVNIAWANKNRSAIIRVPAARG 338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      345 EGINVELRIGGADLNPYLAFSAIIAAGISGIEEKLELPPPASGNVYNDKE-----LPF 397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              65 GGGYEISSVDTGY----SDCHLCADLNSLHLLPW--SEGAVLAISNPHNFVTSEPLFCS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -----NISASSGIETFMRSVRNKLEEAGILMEATHPEFLPSQHELNFVPADPLTMADR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRVILMOQIERLANLKLKGLF - - ASELEFNLFNETYKSASOKHWKNLKTAQPH - - HQWM -
                             CATALYTIC ACTIVITY: ATP + L-glutamate + NH(3) = ADP + phosphate +
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        15-DEC-1998 (Rel. 37, Created)
15-DEC-1998 (Rel. 37, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
Glutamine synthetase (EC 6.3.1.2) (Glutamate--ammonia ligase) (GS)
GLNA OR WTH1570.
Methanobacterium thermoautotrophicum.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             47;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 1; Length 454;
                                                               L-glutamine.
SUBCELLULAR LOCATION: Cytoplasmic (Potential).
SIMILARITY: BELONGS TO THE GLUTAMINE SYNTHETASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      398 FPNSLQNATHLLKESKMLNKTFGEKLILHYVNAANVEINEFSKQVTDWE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           16.8%; Score 398.5; DB 1; 28.9%; Pred. No. 3.5e-24; tive 65; Mismatches 179;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                InterPro; IPRO01691; GLN synth.
InterPro; IPRO01809; GLNA adenyltn.
Pfam; PRO0120; Gln-synt, I.
Pfam; PRO3951; Gln-synt, I.
PRO0100; PRO1057; Gln-synt, I.
PROSITE; PSO0180; Gln-synt, I.
PROSITE; PSO0180; GLNA 1; I.
PROSITE; PSO0181; GLNA 1; I.
Ligase; Complete proteome.
SEQUENCE 454 AA; 51398 MW; 3222CB
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                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; U67574; AAB99355.1; -. PIR; A64468; A64468.
Science 273:1058-1073(1996)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Local Similarity 28.9
es 118; Conservative
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TIGR; MJ1346; -.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
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027612;
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Matches
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GLNA_METTH
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LYDVLEKGVYFDGSSIEGFVSIESSDMMLKPDLKTLSVLPWRPTEKSVARVICDVYTTNG 106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     217
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EPLFCSPRVILMQQIERLANLKLKGLF--ASELEFNLFNETYKSASQKHWKNLKTAQPHH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QWMNI SASSGI ETFMRSVRNKLEEAGI LMEATHPEFL PSQHELNFVPADPLTMADRHIIA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               290 NWIAGLLKYVPEATYFFASYINSYKRLQPLTFAPTKCCWAIDNRTSAFRLCNSKSEGINV
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MEDLINE=96137999; PubMed=8680087;
MEDLINE=96137999; PubMed=8680087;
Bull C.J., White O., Olsen G.J., Zhou L., Fleischmann R.D.,
Sutton G.G., Blake J.A., FitzGerald L.M., Clayton R.A., Gocayne J.D.,
Kerlavage A.R., Dougherty B.A., Tomb J.-F., Adams M.D., Reich C.I.,
Overbeek R., Kirkness B.F., Weinstock K.G., Merrick J.M., Glodek A.,
Scott J.L., Geoghagen N.S.M., Weidman J.F., Fuhrmann J.L., Nguyen D.,
Utterback T.R., Kalley J.M., Peterson J.D., Sadow P.W., Hanna M.C.,
Cotton M.D., Roberts K.M., Hurst M.A., Kaine B.P., Borodovsky M.,
Klenk H.-P., Fraser C.M., Smith H.O., Woese C.R., Venter J.C.;
"Complete genome sequence of the methanogenic archaeon, Methanococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KHGVREMAEQSGMVATFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             23; Gaps
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01-NOV-1997 (Rel. 35, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
Glutamine synthetase (EC 6.3.1.2) (Glutamate--ammonia ligase)
                                                                                                                                                                                                                                                                                                                                                                                                                     Length 446;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        403 QNATHLLKESKMLNKTFGEKLILHYVNAANVEINEFSKQVTDWELNQ 449
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                446 AA; 49421 MW; DDE984106651122A CRC64;
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Archaea; Euryarchaeota; Methanococci; Methanococcales;
Methanocaldococcaceae; Methanocaldococcus.
                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
16.9%; Score 400.5; DB 1;
Best Local Similarity 28.3%; Pred. No. 2.3e-24;
Matches 115; Conservative 70; Mismatches 199;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   454 AA
                       InterPro; IPR001691; GLN synth.
InterPro; IPR004809; GlnA.
InterPro; IPR001809; GlnA.
Efam; PF00120; Gln-synt, I.
Pfam; PF03951; Gln-synt, I.
ProDom; PD001057; Gln synt, C; I.
TIGREAMS; TIGR00653; Gln synt, C; I.
PROSITE; PS00180; GLNA 1; I.
PROSITE; PS00181; GLNA ATP; I.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STANDARD;
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01-NOV-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GLNA METJA
                                                                                                                                                                                                                                                                                                                        Ligase.
SEQUENCE
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220

225

Gape

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337 DPSCNPYLAFAAMLEAGMNGIQNKIDPGEPTEIDVY-EKSMSELREMGIETLPSSLWEAY 395
                                                                                                                                                                                                                                                                                                                   446 AA
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InterPro; IPR001691; GLN synth.
InterPro; IPR004809; GlnA.
InterPro; IPR004809; GlnA.
Pfam; PP00120; gln synt; I.
Pfam; PF03951; gln synt, I.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRAIN=H37Rv;
MEDLINE=98295987; PubMed=9634230;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL; Z70692; CAA94645.1; -.
EMBL; AE007073; AAK46565.1; -.
PIR; B70776; B70776.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mycobacterium tuberculosis.
                                                                                                                                                                                                                                                                                                                   STANDARD;
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TIGR; MT2280; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM N.A.
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                                                                                                                                                                                                                                     Smith D.R., Doucette-Stamm L.A.; Deloughery C., Lee H.-M., Dubois J., Aldredge T., Bashirzadeh R., Blakely D., Cook R., Gilbert K., Harrison D., Hoang L., Keagle P., Lumm W., Pothier B., Qiu D., Spadafora R., Vicare R., Wang Y., Wierzbowski J., Gibson R., Jiwani N., Caruso A., Bush D., Safer H., Patwell D., Prabhakar S., McDougall S., Shimer G., Goyal A., Pietrovski S., Church G.M., Daniels C.J., Mao J.-I., Rice P., Noelling J., Reeve J.N., "Complete genome sequence of Methanobacterium thermoautotrophicum deltaH functional analysis and comparative genomics.";
J. Bacteriol. 179:7135-7155(1997).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  372 AMP (UNDER CONDITIONS OF ABUNDANT GLUTAMINE) (BY SIMILARITY) 50248 MW; B907928AADB960A6 CRC64;
Archaea; Euryarchaeota; Methanobacteria; Methanobacteriales;
Methanobacteriaceae; Methanothermobacter.
NCBI_TaxID=187420;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         L-glutamine.
-!- SUBCELLULAR LOCATION: Cytoplasmic (Potential).
-!- SIMILARITY: BELONGS TO THE GLUTAMINE SYNTHETASE FAMILY.
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InterPro; IPR001691; GLN synth.
InterPro; IPR004809; GlnĀ.
InterPro; IPR001637; GlnĀ_adenyltn.
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Pfam; PF03951; gln-synt_N; 1.
Pr00bm; PD001057; Gln synt_C; 1.
TIGRFAMS; TIGR0653; GlnA; 1.
PROSITE; PS00180; GLNA_1; 1.
PROSITE; PS00181; GLNA_ATP; 1.
                                                                                                                                                                                  STRAIN=Delta H;
MEDLINE=98037514; PubMed=9371463;
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BINDING 372 372
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STRANN=CDC 1551 / Oshkosh;
Fleischmann R.D., Alland D., Eisen J.A., Carpenter L., White O.,
Pleischmann R.D., Alland D., Eisen J.A., Earbenter D., Hickey E.,
Relonay J.F., DeBoy R., Dodson R., Gwinn M.L., Haft D., Hickey E.,
Kolonay J.F., Nelson W.C., Umayam L.A., Ermolaeva M.D., Salzberg S.L.,
Delcher A., Utterback T., Weidman J., Khouri H., Gill J., Mikula A.,
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Submitted (APR-2001) to the EMBL/GenBank/DDBJ databases.
-!- CATALYTIC ACTIVITY: ATP + L-glutamate + NH(3) = ADP + phosphate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "Whole genome comparison of Mycobacterium tuberculosis clinical and
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gole S.T., Brosch R., Parkhill J., Garnier T., Churcher C., Harris Gordon S.V., Eiglmeier K., Gas S., Barry C.E. III, Tekaia F., Badcock K., Basham D., Brown D., Chillingworth T., Connor R., Davies R., Devlin K., Feltwell T., Gentles S., Hamlin N., Holroyd Hornsby T., Jagels K., Krogh A., McLean J., Moule S., Murphy L., Oliver S., Osborne J., Quail M.A., Rajandream M.A., Rogers J., Rutter S., Seeger K., Skelton S., Squares S., Squares R., Sulston J.E., Taylor K., Whitehead S., Barrell B.G.; Deciphering the biology of Mycobacterium tuberculosis from the Nature 393:537-544 (1998).
                                                                                                                                                                                                                                                                                                                                                                             01-0CT-1996 (Rel. 34, Created)
01-0CT-1996 (Rel. 34, Last sequence update)
28-FBB-2003 (Rel. 41, Last annotation update)
Probable glutamine synthetase 2 (EC 6.3.1.2) (Glutamate--ammonia ligase 2).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Bacteria; Actinobacteria; Actinobacteridae; Actinomycetales;
Corynebacterineae; Mycobacteriaceae; Mycobacterium.
NCBI_TaxID=1773;
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-!- SUBCELLULAR LOCATION: Cytoplasmic (By similarity).
-!- SIMILARITY: BELONGS TO THE GLUTAMINE SYNTHETASE FAMILY.
                                                      396 HALEEDDVIKGALGGHVYEKFMEIKHREWDDYRVRVFKYELER 438
HLLKESKMLNKTFGEKLILHYVNAANVEINEFSKQVTDWELNQ 449
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SEQUENCE FROM N.A.
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Q9UY99;
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1-glutamine.

1-glutamine.

1- SUBCELLULAR LOCATION: Cytoplasmic (Potential).

1- SIMILARITY: BELONGS TO THE GLUTAMINE SYNTHETASE FAMILY.

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Archaea; Euryarchaeota; Thermococci; Thermococcales; Thermococcaceae;
Thermococcus.
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CATALYTIC ACTIVITY: ATP + L-glutamate + NH(3) = ADP + phosphate
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MBDLINE=97314661; PubMed=9172372;
Adul Rahman R.N.Z., Jongsareejit B., Fujiwara S., Imanaka T.;
Adul Rahman R.N.Z., Jongsareejit B., Fujiwara S., Imanaka T.;
"Characterization of recombinant glutamine synthetase from the hyperthermophilic archaeon Pyrococcus sp. strain KODI.";
Appl. Environ. Microbiol. 63:2472-2476(1997).
-!- CATALYTIC ACTIVITY: ATP + L-glutamate + NH(3) = ADP + phoss
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15-DEC-1998 (Rel. 37, Last sequence update)
15-DEC-1998 (Rel. 37, Last annotation update)
Glutamine synthetase (EC 6.3.1.2) (Glutamate--ammonia ligase)
                                                                                                                                                                                   Length 446;
                                                                                                                                                                                                                                Indels
ProDom; PD001057; Gln synt_C; 1.
TIGREAMs; TIGR00653; GlnA; 1.
PROSITE; PS00180; GLNA_1; FALSE NEG.
PROSITE; PS00181; GLNA_ATP; FALSE_NEG.
Ligame; Multigene family; Complete proteome.
SEQUENCE 446 AA; 49607 MW; 86F163FD017829DD CRC64;
                                                                                                                                                                              Query Match 16.6%; Score 393.5; DB 1;
Best Local Similarity 28.1%; Pred. No. 8.5e-24;
Matches 116; Conservative 77; Mismatches 175;
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48 DGVSFDGSSIPGFE-GIEDSDLIPKADPSTYAEIPW-EG----IGRVYGYIYKGDEPYQA 101
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         317 SGARIEYRCPDPSANPYLALAGILMVGLDGİKKKVEPDSYVETNVYEMDDAERERLGIDT 376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         203 IVSFKHVVKAVAELHGYYATFMPKPIYGFPGNGMHLHISLWKDGE---NVFIGED---GL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61 EGIAGGGYEISSVDTGYSDCHLC--ADLNSLHLLPWSEGAVLAISNPHNFV--TSEPLFC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             102 DPRGILKRVLERLEKEGLKAHIGPEPEFYIFKKNGTWE--------LHI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             175 SASSGIETFM----RSVRNK----LEEAGILMEATHPEFLPSQHELNFVPADPLTMADR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         285 STLARNWIAGLLKYVPEATYFFASYINSYKRLOPLTFAPTKCCWAIDNRTSAFRLCNSKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            398 FPNSLQNATHLLKESKMLNKTFG------EKLILHYVNAANVEINEFSKQVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           6 DELNNLIRNGKIDT-----VVLACVDMQGRLMGKRLTGRHFLGLDQKKISISTFVYAVTI
                                                                                                                                                                                                                                                                                                                                                                                                                                             Gape
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Archaea, Euryarchaeota, Thermococci, Thermococcales, Thermococcaceae,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 16-CCT-2001 (Rel. 40, Created)
16-OCT-2001 (Rel. 40, Last sequence update)
15-SEP-2003 (Rel. 42, Last annotation update)
Glutamine synthetase (EC 6.3.1.2) (Glutamate--ammonia ligase) (GS)
                                                                                                                                                                                                                                                                                                                                                                                                                                             90;
                                                                                                                                                                                                                                                                                                                                                                                              Length 443;
                                                                                                                                                                                                                                                                                                                                                                                                                                             78; Mismatches 183; Indels
                                                                                                                                                                                                                                                                                        362 362 AMP (UNDER CONDITIONS OF A. GLUTAMINE) (BY SIMILARITY) 443 AA; 50259 MW; 9426DCCFEEF18168 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                              Score 391; DB 1;
Pred. No. 1.3e-23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     439 AA
                                   InterPro; IPR001691; GLN synth.
InterPro; IPR004809; GLNA.
InterPro; IPR004809; GLNA.
InterPro; IPR001637; GLNA.
Pfam; PF00120; 91n-synt; 1.
Pfam; PF001951; gln-synt; 1.
TIGRPAMS; TIGR00653; GlNA, 1.
PROSITE; PS00180; GLNA_1; 1.
PROSITE; PS00181; GLNA_1; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GLNA OR PYRAB16090 OR PAB1292.
                                                                                                                                                                                                                                                                                                                                                                                              16.5%;
28.1%;
D86222; BAA20530.1;
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tches 137; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 451
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EWELERYF
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NCBI_TaxID=29292;
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This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@lsb-sib.ch).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                343 İKHKVEPFAYVEBNVYEMDEGKRKELGIDTLPGSLGBALDELEKDKVVREALGEAYKNFI 402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   136 GLFASELEFNLFNETYKSASQKHWK-NLKTAQPHHQWMNISASSGIETFMRSVRNKLEEA 194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          79
                                 Cohen G.N., Barbe V., Flament D., Galperin M., Heilig R., Lecompte O., Poch O., Prieur D., Querellou J., Ripp R., Thierry J.-C., Van der Oost J., Weissenbach J., Zivanovic Y., Forterre P., An integrated analysis of the genome of the hyperthermophilic archaeon Pyrococcus abyssi.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       228 PGNGMHLHISLW--KEGENIF---KGEEGLSETALHFIGGLLKHAKALTAITNPTVNSYK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                62 SDLIFKADPDTYVEVPWDN-----VARVYGYIYKDGKPYGADPRGVLKRVIEKLAEMGIK
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           17 VQLIFVDINGMPKGMEIPASRL---QEAIE-----DGISFDGSSVPGFQ-GIED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     80 CHLC--ADLNSLHLLPWSEGAVLAISNPHNFV--TSEPLFCSPRVILMQQIERLANLKLK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        117 AYIGPEPEFYLFK---KNGS---WELEIPDVGGYFDILTLDKAKDIK---REIAEYMPSF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  195 GILMEATHPEFLPSQHELNFVPADPLTMADRHIIAKHGVREMAEQSGMVATFMAKLSSTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   283 KLVPGYEAPVYISWGYKNRSALIRVPAFWGNGARIEYRCPDPSANPYFAFAAILMAGLDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                             Mol. Microbiol. 47:1495-1512(2003). 
-!- CATALYTIC ACTIVITY: ATP + L-glutamate + NH(3) = ADP + phosphate L-glutamine.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AMP (UNDER CONDITIONS OF ABUNDANT
                                                                                                                                                                                             -1- SUBCELLULAR LOCATION: Cytoplasmic (Potential).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            16.4%; Score 389.5; DB 1; Length 4: 28.0%; Pred. No. 1.7e-23; tive 73; Mismatches 195; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GLUTAMINE) (BY SIMILARITY).
62CCFD3970A98AF0 CRC64;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -----KLILHYVNAANVEINEFSKOVTDWELNOGF 451
                                                                                                                                                                                                                                                                                                                                                                                                            EMBL, AJ248288; CAB50513.1; -. PIR; C75009; C75009. HSSP; P06201; LIGE. InterPro; IPR001691; GIN synth. InterPro; IPR001691; GINA adenyltn. Pfam; PP00120; GIN-synt, I. Pfam; PP00120; GIN-synt, I. Propom; PP0010157; GIN-synt, I. PR051TE; PS00180; GINA, I. PR05ITE; PS00180; GINA, I. PR05ITE; PS00180; GINA, I. Ligase; Complete proteome. BINDING 358 358 AMP (UND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     439 AA; 49742 MW;
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Search completed: December 17, 2003, 22:43:22 Job time : 14 secs

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GenCore version 5.1.6
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OM protein - nucleic search, using frame_plus_p2n model

Run on: December 17, 2003, 22:51:35; Search time 2955 Seconds

(without alignments)
3734.089 Million cell updates/sec

Title: US-10-098-602A-2
Perfect score: 2376
Sequence: 1 MITYDELNNLIRNGKIDTV......INBFSKQVTDWELNQGFNRY 454
Scoring table: BLOSUM62
Xgapop 10.0, Xgapext 0.5
Ygapop 10.0, Ygapext 0.5
Ygapop 10.0, Ygapext 7.0
Delop 6.0, Delext 7.0
Delop 6.0, Delext 7.0
Belop 6.0, Delext 7.0
Minimum DB seq length: 0
Maximum DB seq length: 0
Maximum DB seq length: 2000000000
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Command line parameters:

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Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

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gb_est4:*
gb_est5:*
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em_estmu:*
em_estov:*
em_estpl:* em_estro:* em_htc:* gb_est1:* gb_est2:* gb_htc:* em_gas em_gss em ges em gas EST: * 111. 121. 14. 15. 115. 116. 119. .. Database

29: gb_gss2:*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

Description	AW870989 ra53c1	3772 ra73h	74375 ru99e08	79008 ru39e1	01245 PUBMNI	13184 PUHHO6	31873 PUHFA22	35035 PUBMC	0/1/1	B2569521 DACE2-164	37214 PUBD	8241 BJ3582	36680 rock	163 AU039	39227 PUHM	12677 TDGD	34742 Fgr 5	BZ668122 PUBCR86TD	0929 M32 Wher	70295	CC435159 PUHDF85TB	1494	CC435165 PUHDF85TD	9052	BZ558114 pacs1-60	0001		325 7	1896	3734	3177	PUHFA22	AY109282	5662 EST26610	40402 WHE	58011 BJ268011	<u> </u>	51228 FgrN 5	1957 WHE302	32096 WHE3028	452699 WHE1	0570 6041312	276033 Cr_Emb_	
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SUMMARIES	AW87098	1772	437	906	124	318	187	503	7 6	BZ569521	721	824	899	163	922	26	474	817	929	029	212	449	516	905	811	200	CB853860	92	78	873	817	18	928	662	040	100		5122	195	8209	45269	9057	27603	
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ALIGNMENTS

RESULT 1

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/note="vector: ZAP express - pBKCNV (Stratagene); Site_l:
/note="vector on the period of the pBKCNV (Stratagene); Site_l:
/contructed and cloned unidirectionally into the vector
within the 5' ECORI and 3' XhoI sites. This library was
constructed by Dr. Uma Rao and Dr. David Bird at North
Carolina state University."
38 a 80 c 90 g 134 t
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Tylenchoidea; Heteroderidae; Meloidogyninae; Meloidogyne.
1 (Dasea 1 to 442)
McCarter, J. (Clifton, S., Chiapelli, B., Pape, D., Martin, J., Wylie, T., Dante, M., Marra, M., Hillier, L., Kucaba, T., Theising, B., Bowers, Y., Gibbons, M., Ritter, B., Bennett, J., Franklin, C., Tagaratalshvili, R., Ronko, I., Kennedy, S., Maguire, L., Beck, C., Underwood, K., Sreptoe, M., Allen, M., Person, B., Swaller, T., Harvey, N., Schurk, R., Kohn, S., Shin, T., Uackson, Y., Cardenae, M., McCann, R., Waterston, R. and
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The library was constructed by Uma Rao and David Bird
Gavid birdencau.edu) at North Carolina State University. DNA
Sequencing by: Washington University Genome Sequencing Center St.
Louis.
Trace considered overall poor quality
Seq primer: -40RP from Gibco
High quality sequence stop: 1.
                                              TyrValAsnAlaAlaAsnValGluIleAsnGluPheSerLysGlnValThrAspTrpGlu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Unpublished Contact: McCarter JP Contact: McCarter JP The Washington Univ. Nematode EST Project, 1999 Washington University School of Medicine 4444 Forest Park Parkway, Box 8501, St. Louis, MO 63108, Tel: 314 286 1800
                                                                                                                                                                                                                                                                                                                                                                                                       Meloidogyne incognita (southern root-knot nematode)
Meloidogyne incognita
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McCarter, J., Clifton, S., Chiapelli, B., Pape, D., Martin, J., Wylie, T., Dante, M., Marra, M., Hiller, L., Kucaba, T., Theising, B., Bowers, Y., Glbbons, M., Ritter, E., Bennett, J., Franklin, C., Tsagareishvili, R., Ronko, I., Kennedy, S., Maguire, L., Beck, C., Underwood, K., Steptoe, M., Allen, M., Person, B., Swaller, T., Harvey, N., Schurk, R., Kohn, S., Shin, T., Jackson, Y., Cardenas, M., McCann, R., Waterston, R. and
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contructed and cloned unidirectionally into the vector
within the 5' EcoRI and 3' Xhol sites. This library was
constructed by Dr. Uma Rao and Dr. David Bird at North
carolina state University."
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                                                                                                                                                                                                                      Contact: McCarter JP
The Washington Univ. Nematode EST Project, 1999
Washington University School of Medicine
4444 Forest Park Parkway, Box 8501, St. Louis, MO 63108, USA
Tel: 314 286 1800
Fax: 314 286 1810
Email: est@watson.wustl.edu
The library was constructed by Uma Rao and David Bird
(david bird@ncsu.edu) at North Carolina State University. DNA
Sequencing by: Washington University Genome Sequencing Center:
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The Washington Univ. Nematode EST Project, 1999
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High quality sequence stop: 410.
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621 bp mRNA linear EST 18-WAR-2003 ru99e08.yl Heterodera glycines cDNA S' similar to TR:088070 088070 PUTATIVE GLUTAMINE SYNTHETASE.
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Heterodera glycines
Bukaryota, Metazoa, Nematoda, Chromadorea, Tylenchida; Tylenchina;
Tylenchoidea; Heteroderidae; Heteroderiae; Heterodera

1 (bases 1 to 621)
McCarter, J., Clifton, S., Chiapelli, B., Pape, D., Martin, J., Wylie, T., Dante, M., Marra, M., Hiller, L., Kucaba, T., Theising, B., Bowers, Y., Glbbons, M., Ritter, E., Bennett, J., Franklin, C., Tagareishvlli, R., Ronko, I., Kennedy, S., Maguire, L., Beck, C., Underwood, K., Steptoe, M., Allen, M., Person, B., Swaller, T., Harvey, N., Schurk, R., Kohn, S., Shin, T., Jackson, Y., Cardenas, M., McCann, R., Waterston, R. and
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AlaSerTyr11eAsnSerTyrLysArgLeuGlnProLeuThrPheAlaProThrLysCys
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The Washington Univ. Nematode EST Project, 1999
Washington University School of Medicine
4444 Forest Park Parkway, Box 8501, St. Louis, MO 63108, USA
Fel: 314 286 1810
Fax: 314 286 1810
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High quality sequence stop: 481. Location/Qualifiers

FEATURES

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/clone lib="Heterodera glycines virgin female"
/clone lib="Heterodera glycines virgin female"
/note="Vector: pBluescript SK+ (Stratagene); Site 1: XhoI;
Site 2: BCoRI; This library was generated by cloning cDNAs
directionally into Uni-ZAP(Stratagene) (T3 primer/BCoRI
are at the 5'-end and T7/XhoI are at the 3'-end). The
library was excised (now in pBluescript SK(+)) and
normalized (Bonaldo et al 1996 Genome Research 6:791-806).
Library constructed by Thomas Baum (tbaum@iastate.edu),
lowa State University, Plant Pathology Department and Jeff
MCDermott (jpmcderm@iastate.edu)."
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Conservative:
Mismatches:
Indels:
organism="Heterodera glycines"
                                                             tissue_type="whole organism"
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                                                 /sex="female"
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Spermatophyta, Magnoliophyta, Liliopaida, Poalea, Poaceae, PACCAD
clade, Panicoideae, Andropogoneae, Zea.
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/clone="lb="zM_0.6_1.0_KB"
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CoT selected appendic DNA library".
                                                                            ThrileGluGlyIleAlaGlyGlyGlyTyrGluIleSerSerValAspThrGlyTyrSer 78
                                                                                                                                                                  79 AspCysHisLeuCysAlaAspLeuAsnSerLeuHisLeuLeuProTrpSerGluGlyAla 98
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Mitclaw,C.A., Quackenbush,J., Van Aken,S., Utterback,T., Resnick Whitelaw,C.A., Fraser,C.M., Yuan,Y., San Miguel,P., Ma,J. and Bennetzen,J. Maize Genomics Consortium
           TTGTTGAAATGGCGCAAAAAAAAGACAAAATGTCCATGTGCTATTTCCTTGCGATG
                                                                                                     7112 Medical Center Drive, Rockville, MD 20850, USA Tel: 301-838-5843
Fax: 301-838-0208
Email: whitelaw@tigr.org
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/organism="Zea mays"
/mol_type="genomic DNA"
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Washington University School of Medicine
444 Forest Park Parkway, Box 8501, St. Louis, MO 63108, USA
Tel: 314 286 1810
Fax: 314 286 1810
Fax: 315 286 1810
Fax: 315 286 1810
This library was generated by cloning cDNAs directionally into
Univariant of Typ Arimer/EcoRI are at the 5'-end and T7/XhoI
are at the 3'-end). The library was excised [now in pBluescript
SK(+)] and normalized (Bonaldo et al 1996 Genome Research 6:791-806
). Library constructed by Thomas Baum (tbaum@iastate.edu), Iowa
State University, Plant Pathology Department and Jeff McDermott
(jpmcderm@iastate.edu).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     / Lissue_type="whole organism"
/ dev stage="4th stage juvenile"
/ dab_nost="bullon"
/ lab_host="bullon"
/ clone lib="Heterodera glycines J4"
/ can and T7/XhoI are at the 3'-end). The library was excised [now in pBluescript SK(+)] and normalized (Bonaldo et al 1996 Genome Research 6:791-806).
Library constructed by Thomas Baum (tbaum@iastate.edu),
Iowa State University, Plant Pathology Department and Jeff McDermott (jpmcderm@iastate.edu).

McDermott (jpmcderm@iastate.edu)."
                                                                                                                                                       McCarter, J., Clifton, S., Chiapelli, B., Pape, D., Martin, J., Wylie, T., Dante, M., Marra, M., Hillier, L., Kucaba, T., Theising, B., Bowers, Y., Glbbons, M., Ritter, E., Bennett, J., Franklin, C., Tagagardshvilli, R., Ronko, I., Kennedy, S., Maguire, L., Beck, C., Underwood, K., Sreptoe, M., Allen, M., Person, B., Swaller, T., Harvey, N., Schurk, R., Kohn, S., Shin, T., Jackson, Y., Cardenas, M., McCann, R., Waterston, R., and
                                                      Heterodera glycines
Heterodera glycines
Eukaryota, Metazoa; Nematoda, Chromadorea; Tylenchida; Tylenchina;
Tylenchoidea; Heteroderidae; Heteroderinae; Heterodera.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                         375 ACGCCGAACAAGGCGTCGCGACGCATCGAGGTCCGCAGCCCCGACTCGACTTGTAAC 316
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         195 ATGGGCTACACCGAGCTGCCCGGCAGCCTCGAGGCGCTCAAGGCGATGGAGTCCTCG 136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GAGCTGGTCGCCGAGCACTCGGCGAGCACTGTTCGACTACTTCCTCCGCAACAGTGG 76
                                                                                                                                                                         243 ValAlaThrPheMetAlaLysLeuSerSerThrAlaLeuGlyAsnAlaCysHisIleHis
                                                                                                                                                                                                                                                                                  303 ThrTyrPhePheAlaSerTyrILeAsnSerTyrLysArgLeuGlnProLeuThrPheAla :::
                                                                                PheMetArgSerValArgAsnLysLeuGluGluAlaGlyIleLeuMetGluAlaThrHis
                                                                                                                                                   789 CACGAGGGTGCCCCGGGTCAGCAGGAGATCTCCCGCTACGCCGACGCGCTGTCGATG
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                                                                                                      849 Tricceccicicaceccarceacecericaidercearedeciarierecerceacide
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             291 TrplleAlaGlyLeuLeuLysTyrValProGluAlaThrTyrPhePheAlaSerTyrlle 310
Eukaryota, Viridiplantae, Streptophyta; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; Liliopaida; Poales; Poaceae; PACCAD calde; Panicoideae; Andropogoneae; Zea.

(Dases 1 to 825)
Whitelaw, C.A., Quackenbush, J., Van Aken, S., Utterback, T., Resnick A., Praser, C.M., Yuan, Y., San Miguel, P., Ma, J. and Bennetzen, J. Unpublished
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 396 gcgaaccgcrccarccarccgcrrcrccccrgracacgccgaacaaggcgrcgrcgcga 337
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93
54
1110
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/clone=ib="ZM_0.6_1.0 KB"
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COT selected genomic DNA library"
a 258 c 298 g 148 t
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Location/Qualifiers
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                                                                                                                                    420
                                                    276 CTCGCCGCCGGACTCAAGGGCATCGCCGAGAAGTACGAGCTGCCCGACGACGAGGCCGAGGAC 217
                                                                               AsnValTyr------AsnAspLysGluLeuProGluPheProAsn 400
                                                                                                          216 GACGICTGGGCCCTCACCTCGGCCGAGGGTCGCACGACGGGCTACACCGGAGCTGCCCGGC 157
                                                                                                                                                                                       GluLysLeulleLeuHisTyrValAsnAlaAlaAsnValGluIleAsnGluPheSerLys 440
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Eukaryots, Viridiplantae, Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnollophyta; Liliopsida; Poales; Poaceae; PACCAD
clade; Panicoideae; Andropogoneae; Zea.
I (bases 1 to 831)
Whitelaw, C.A., Quackenbush, J., Van Aken, S., Utterback, T., Resnick
A., Fraser, C.M., Yuan, Y., San Miguel, P., Ma, J. and Bennetzen, J.
Maize Genomics Consortium
CGCATCGAGGTCCGCAGCCCCGACTCGGCTTGTAACCCCTACCTGACGTTCGCGGTGCTG 277
                          368 IlealaalaGlyIleSerGlyIleGluGluLysLeuGluLeuProProAlaSerGly 387
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/note="Vector: pcR4-TOP0; Site_1: EcoRI; 0.6-1.0 kb high
CT selected genomic DNA library"
269 c 388 g 153 t
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                                                                                                                                                    SerLeuGlnAsnAlaThrHisLeuLeuLysGluSerLysMetLeuAsnLysThrPheGly
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Fax: 301-838-0208
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183 PheMetArgSerValArgAsnLysLeuGluGluAlaGlyIleLeuMetGluAlaThrHis 202

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BZ705035 815 bp DNA linear GSS 19-FEB-2003
PUBMO84TD ZM_0.6_1.0_KB Zea mays genomic clone ZMMBTa089N23,
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(bases 1 to 815)
Whitelaw, C.A., Quackenbush, J., Van Aken, S., Utterback, T., Resnick, A., Fraser, C.M., Yuan, Y., San Miguel, P., Ma, J. and Bennetzen, J. Unpublished
AlaAspArgHisIleIleAlaLy8HisGlyValArgGluMetAlaGluGlnSerGlyMet 242
                                                                                                                                                                                                                                                                                                        243 ValAlaThrPheMetAlaLysLeuSerSerThrAlaLeuGlyAsnAlaCysHisIleHis 262
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385 CCGACCGCCGCCGACGTGGCGCGAACCGCTCCCCGCTCATCCGGCTCCTGTAC 326
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679 GCCGACAACGTCATGACCTTCCGCTACATCGTCAAGGAGGTCGCGATCGGTGAGGTGTG
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                                                                                ProGluPheLeuProSerGlnHisGluLeuAsnPheValProAlaAspProLeuThrMet
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9712 Medical Center Drive, Rockville, MD 20850, USA
Tel: 301-838-5843
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BZ705035.1 GI:28425443
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356 AlaAspLeuAsnProTyrLeuAlaPheSerAlaIleIleAlaAlaGlyIleSerGlyIle 375
       147 TTCCTCCGCAACAAGTGGACCGAGTGGAACGACTACCGCAGCCGGGTCACCCCGTTCGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                      /organism="Dictyostelium
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /mol_type="mRNA"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /sex="mat A"
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330.50
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Best Local Similarity:
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VERSION
KEYWORDS
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AUTHORS
TITLE
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                                                                                                                             /db_xref="taxon:4577"
/clone="ZMMBTa089N23"
/clone=lib="ZM_0.61.0 kB"
/note="Vector: pCR4-TOPO; Site_1: EcoRI; 0.6-1.0 kb high
COT selected genomic DNA library"
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Fax: 301-838-0208
Email: whitelaw@tigr.org
Seq primer: TF
Class: sheared ends.
Location/Qualifiers
1. .815
/organism="Zea mays"
/mol type="genomic DNA"
/strain="B73"
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88
                                                                                                                                                                                                                                                                                                           Dictyostelium discoideum
Dictyostelium discoideum
Bictyostelium discoideum
Eukaryota; Mycetozoa; Dictyosteliida; Dictyostelium.
1 (bases 1 to 690)
Urushihara,H., Tanaka,Y., Kohara,Y. and Shin-i,T.
Full length cDNA of Dictyostelium discoideum at the aggregation
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/clone_lib="Dictyostelium discoideum
110 c 112 g. 262 t 2 ot
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Contact: Tadasu Shin-i
Center For Genetic Resource Information
National Institute of Genetics
Int Yata, Mishima, Shizuoka 411-8540, Japan
Tel: 81-559-81-6855
Fax: 81-559-81-6855
Email: tshini@genes.nig.ac.jp.
Location/Qualifiers
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BZ569521 1176 bp DNA linear GSS 17-DEC-2002 pace2-164_871.s2 pace2-164 Pseudomonas aeruginosa genomic clone pace2-164_871, genomic survey sequence.
                                                                                 AspGlnAsnAspGluTyrGlyMetSerThrLeuAlaArgAsnTrpileAlaGlyLeuLeu
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Bacteria; Proteobacteria; Gammaproteobacteria; Pseudomonadales;
Pseudomonadacea; Pseudomonas.
1 (Dases 1 to 1176)
Spencer, D.H., Raymond, C.K., Smith, E.E., Sims, E.E., Hastings, M.,
Burns, J.L., Kaul, R. and Olsen, M.V.
Whole-Genome-Sequence variation among multiple isolates of
Psedomonas aeruginosa library
J. Bacteriol., (2002) In press
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ccgactcggcttgtaacccctacctgacgtrcgcggtgctgctgctgccgccgactcag
::: :::||||||||||:::|||
523 AACCCGGACGCCGGTGCAGCTCTCGGACAGCAGCAGTTCATCGCCGGCATCCTG
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                                                         AsnalaCysHisIleHisMetSerLeuGlnAspalaGluThrGluLysAsnAlaPheTyr
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Contact: Chris K. Raymond
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Location/Qualifiers

1. 699
/organism="Zea mays"
/organism="Zea mays"
/organism="Zea mays"
/do_xref="taxon:4577"
/db_xref="taxon:4577"
/clone="ZemBra045123"
/clone="ZemBra045123"
/clone="Yector: pCR4-TOPO; Site 1: EcoRI; 0.6-1.0 kb high
COT selected genomic DNA library"
                                                                                                                                                                                                                                                                                                                                                                                                             BZ684738 699 bp DNA linear GSS 05-FEB-2003
PUBRS60TD ZM 0.61.0 KB Zea mays genomic clone ZMMBTa045123,
genomic survey sequence.
BZ684738
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Zea mays

Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; PACCAD
clade; Panitoideae; Andropogoneae; Zea.

(bases 1 to 699)
Whitelaw,C.A., Quackenbush,J., Van Aken,S., Utterback,T., Resnick
A., Fraser,C.M., Yuan,Y., San Miguel,P., Ma,J. and Bennetzen,J.
Unpublished
 369 TCAGATGTAAATCCTTACATTTCAATCGCCGCTTCATTCGCTGCTGGTCTCTATGGTGT 310
                                                             GluGluLysLeuGluLeu---ProProProAlaSerGlyAsnValTyrAsn----Asp 392
                                                                                                                                         LysGluLeuProGlu---PheProAsnSerLeuGlnAsnAlaThrHisLeuLeuLysGlu 411
                                                                                                                                                                         249 AAAGGACTAGTTGAAAGATTACCAAGATCATTAGCTGAATCAACTGAATTACTATCAAAA 190
                                                                                                                                                                                                                   SerLysMetLeuAsnLysThrPheGlyGluLysLeuIleLeuHisTyrValAsnAlaAla 431
                                                                                                 309 ATTAACAAATTAGAATTAAAACAAAAACCAATCATAGGTAATAGTTATGATCTCTATAAA
                                                                                                                                                                                                                                       217 AlaAspProLeuThrMetAlaAspArgHisIleIleAlaLysHisGlyValArgGluMet
                                                                                                                                                                                                                                                                                             432 AsnValGluIleAsnGluPheSerLysGlnValThrAspTrpGluLeuAsnGln 449
                                                                                                                                                                                                                                                                                                                   129 CGTTGGGAATATAGACAATTCAATCATCAAGTTCATAAATGGGAATTAGAAAGA 76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Contact: Cathy Whitelaw
TIGR
TYZ Medical Center Drive, Rockville, MD 20850, USA
Tel: 301-838-5843
Fax: 301-838-0208
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Class: sheared ends
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Best Local Similarity:
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DNA linear GSS 05-FEB-2003
genomic clone ZMMBTa029D11,
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1 (bases 1 to 818)
(Whitelaw, C.A., Quackenbush, J., Van Aken, S., Utterback, T., Resnick, A., Praser, C.M., Yuan, Y., San Miguel, P., Ma, J. and Bennetzen, J. Unpublished
  192 GCCGGGCGCCGATCGAAGGCAACTCCTACGAGCAGATGGAG---CCGAGCCTGCCGAA 136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GGCTGGCAGCCGATCGTCGCGCCGGAAATGGAGTTCTACCTG-----ACC 140
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 141 CAGCGCTGCGAAGACCCGGACCTGCCGCTGAAAACCCCAGTAGGCCGCTCGGGCCGCGCC 200
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                                           13.5 CAACTTGCGCGAGCCCTGCGCGAGCTGAAGGCGAAGATCATGGCGAAGTACATCGA
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                             nSerieuGlnAsnAlaThrHisLeuLeuLysGluSerLysMetLeuAsnLysThrPheGl
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/clone="taxon.6.1.0 kB"
/cor selected genomic DNA library"
z87 c 232 g 135 t
                                                                                420 yGluLysLeuIleLeuHisTyrValAsnAlaAlaAsnValGluIle 435
                                                                                                 SerAlaSerGlnLysHisTrpLysAsnLeuLysThr ------
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Fax: 301-838-0208
Email: whitelaw@tigr.org
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Matches:
Conservative:
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PUBDISTD ZM_0.6_1.0_KB Zea mays
Genomic survey sequence.
BZ687214
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/organism="Zea mays"
/mol_type="genomic DNA"
/strain="B73"
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Class: sheared ends.
Location/Qualifiers
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TIGR
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Best Local Similarity:
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                                                                                                                                                                                                                                                                                       888
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                                                                                                                                                                                                                                                                                                             ---AsnLysLeuGlu
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/db xref="taxon:287"
/clone="pas2-164_871"
/clone lib="pas2-164"
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135
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Matches:
Conservative:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                312 ATTAACAAATTAGAATTAAAAACAAAAACCAATCATAGGTAATAGTTATGATCTCTATAAA 253
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192 TCAAAGATTGCAAAAGAATACCTTGGTGAAGAATTTGTNGAFCATTTCGTTGAAACTCGT 133
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Mastigamoeba balamuthi
Mastigamoeba balamuthi
Bukaryota, Pelobiontida, Mastigamoebidae, Mastigamoeba.
1 (Dases 1 to 1138)
Bapteste, E., Brinkmann, H., Lee, J.A., Moore, D.V., Sensen, C.W.,
Gordon, P., Durufle, L., Gaasterland, T., Lopez, P., Muller, M. and
Philippe, H.
The analysis of 100 genes supports the grouping of three highly
divergent amoebae: Dictyostelium, Entamoeba, and Mastigamoeba
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rockefeller.0.366 Mastigamoeba balamuthi lambda ZAP II Library
Mastigamoeba balamuthi cDNA similar to glutamine synthetase (EC
/dev stage="Aggregation stage"
/clone lib="Dictyostelium discoideum cDNA library, AF"
109 c 108 g 256 t 9 others
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BJ358241 Dictyostellum discoideum cDNA library, AF Dictyostellum discoideum cDNA clone dda56b22 3', mRNA sequence.
BJ358241. GI:19257836
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                                            SerValArgAsnLysLeuGluGluAlaGlyIleLeuMetGluAlaThrHisProGluPhe 205
                                                                              GACGICIACGACTGCGAAGCCCCAGGCCTGGACCTCGACACGTTGATCCACGAAGAC 320
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /organism="Dictyostelium discoideum"
/mol_type="mRNA"
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/clone="ddas6b22"
/sex="mat A"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Contact: Tadagu Shin-i
Center For Genetic Resource Information
National Institute of Genetics
1111 Yata, Mishima, Shizuoka 411-8540, Japan
Fax: 81-559-81-6855
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Email: tshini@genes.nig.ac.jp.
Location/Qualifiers
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                                                                                                                                                                                         /organism="Mastigamoeba balamuthi"
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/strain="ATCC 30984"
/db_xref="taxon:108607"
/clone lib="Mastigamoeba balamuthi"
/note="syn: Phreatamoeba balamuthi"
387 c 333 g 169 t
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 Proc. Natl. Acad. Sci. U.S.A. 99 (3), 1414-1419 (2002)
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Laboratory of Biochemical Parasitology
The Rockefeller University
1230 York Avenue, New York, NY 10021, U
Email: mmuller@rockvax.rockefeller.edu
Insert Length: 1138 Std Error: 0.00
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AU039163 AUCTYOBIELLIUM discoideum SS (H.Urushihara) Dictyostelium discoideum SS (H.Urushihara) Dictyostelium discoideum cDNA clone SSM462, mRNA sequence.
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Bukaryote, Myctoczoa, Dictyosteliida, Dictyostelium.

1 (bases 1 to 584)
Morio, T., Urushihara, H., Saito, T., Ugawa, Y., Mizuno, H., Yoshida, M.
Yoshino, R., Mitra, B.M., Pi, M., Sato, T., Takemoto, K., Yasukawa, H.,
Williams, J., Maeda, M., Takeuchi, I., Ochiai, H. and Tanaka, Y.
The Dictyostelium developmental cDNA project: generation and
                                                                                                                       380 GluLeuProProAlaSerGlyAsnVal-----TyrAsnAspLysGluLeuProGlu 397
                                                                                                                                                              635 GACATCACCGACGTGCAGGACACGCGTATCGAGTACCGTGGAGGCGACGCGTCGGGCAGC
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/clone="SSM462"
/dev_stage="slug"
/clone_lib="Dictyostelium discoideum SS (H.Urushihara)"
85 c 94 g 180 t
                                                                                                                                                                                                                                 398 ------PheProAsnSerLeuGlnAsnAlaThrHisLeuLeuLysGluSer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Fax: 81-298-53-6614
Email: hideko@biol.tsukuba.ac.jp
PROJECT = 'Dictyostelium discoideum cDNA project in Japan'
                                                                                                                                                                                                                                                                                       413 LysMetLeuAsnLysThrPheGlyGluLysLeulleLeuHisTyrValAsn 429
                                                                                                                                                                                                                                                                                                                    1-1-1 Tennoudai, Tsukuba, Ibaraki 305-8572, Japan
Tel: 81-298-53-4664
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/organism="Dictyostelium discoideum"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Contact: Hideko Urushihara
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AU039163.1 GI:3985916
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Query Match:
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420 GlyGluLysLeuIleLeuHisTyrValAsnAlaAlaAsnValGluIleAsnGluPheSer 439
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          61 CCATTTTTCGCACCAACAATCAATAGTTATAAAACGTTTAGTCGATGGGTATTGGGCACCA 120
                                                                                                                                  383 ProProAlaSerGlyAsnValTyrAsn-----AspLysGluLeuProGlu---PhePro 399
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Search completed: December 18, 2003, 01:17:46 Job time : 2974 secs

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Sequence 12, Appl
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110 US-09-974-300-261
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APPLICANT: IKEDA, HARUO
APPLICANT: ISHIKAWA, JUN
APPLICANT: HISHIKAWA, JUN
APPLICANT: HORIKAWA, HIROSHI
APPLICANT: SHIBA, TADAYOSHI
APPLICANT: SACKAL! YOSHITUKI
APPLICANT: HATTOR!, MASAHIRA
TITLE OF INVENTION: NOVEL POLYNUCLEOTIDES
FILE REFERENCE: 249-262
CURRENT APPLICATION NUMBER: US/10/156,761
CURRENT FILING DATE: 2002-05-29
PRIOR PLLING DATE: 2001-05-30
PRIOR FILING DATE: 2001-05-30
PRIOR FILING DATE: 2001-06-02
NUMBER OF SEQ ID NOS: 15109
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11.8 1503 1

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-DE-Ebblished Applications NA -OFMT=fastap -SUFFIX=rnpb -MINMATCH=6.1.
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-THR MIN=0 -ALIGN=15 -MODE=LOCAL -OUTFMT=pto -NORM=ext -HEAPSIZE=500 -MINLEN=0
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                                                                                                                                                    December 18, 2003, 00:54:51 ; Search time 457 Seconds (without alignments) 3310.329 Million cell updates/sec
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| Cgn2_6/ptodata/1/pubpna/USO9_NEW_PUB.seq:*
                     GenCore version 5.1.6
(c) 1993 - 2003 Compugen Ltd.
                                                                                                         - nucleic search, using frame_plus_p2n model
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Command line parameters:

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        422 LysLeulleLeuHisTyrValAsnAlaAlaAsnValGlulleAsnGluPheSerLysGln 441
342 SerLysSerGluGlyIleAsnValGluLeuArgIleGlyGlyAlaAspLeuAsnProTyr
                                                      302 AlaThrTyrPhePheAlaSerTyrIleAsnSerTyrLysArgLeuGlnProLeuThrPhe
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APPLICANT: IKEDA, HARUO
APPLICANT: ISHIKAWA, JUN
APPLICANT: BSHIKAWA, JUN
APPLICANT: HORIKAWA, JUN
APPLICANT: SHIBA, TADAYOSHI
APPLICANT: SAKAKI, YOSHIYUKI
APPLICANT: AATTORI, MASAHIKA
TITLE OF INVENTION: NOVEL POLYNUCLEOTIDES
FILE REFERENCE: 249-262
CURRENT FILING DATE: 2002-05-29
PRIOR PLLICATION NUMBER: JP 2001-204089
PRIOR PLLING DATE: 2001-05-30
PRIOR PLLING DATE: 2001-05-30
PRIOR APPLICATION NUMBER: JP 2001-272697
PRIOR PLING DATE: 2001-08-02
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; OTHER INFORMATION: a, t,
US-10-156-761-1
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175
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Mismatches:
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Matches:
 ORGANISM: Streptomyces avermitilis
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38.72%
32.55%
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Best Local Similarity:
Query Match:
                FEATURE:

; NAME/KEY: CDS

; LOCATION: (1)..(

US-10-156-761-6703
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TITLE OF INVENTION: METHOD FOR PRODUCING L-GLUTAMINE BY FERMENTATION AND L-GLUTAMINI-
TITLE OF INVENTION: METHOD FOR PRODUCING L-GLUTAMINE BY FERMENTATION AND L-GLUTAMINI-
FILE REFERENCE: 1291918105
CURRENT APPLICATION NUMBER: US/10/062,458
CURRENT FILING DATE: 2002-02-05
PRIOR APPLICATION NUMBER: JP 2001-28163
PRIOR APPLICATION NUMBER: JP 2001-162806
PRIOR PILING DATE: 2001-05-30
NUMBER OF SEQ ID NOS: 25
SOFTWARE: Patentin version 3.1
SEQ ID NO 1
                                                                                                                                                                                                                                                                                             8042300 GACGTGGCCCACTACCGCAACATGGCGCGCGTCGAACTGAAGGCCTTCGACGCCGCG 8042359
8042063 GGCCACGGCCGCTCGATGCGCTTCGAGAACCGGCTCCCCGGCGGTGACGTCAACCCGCAC 8042122
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                                                                                                                                                                                                                  8042240 CTGCGCGGAGCCGGAACTCTGGGAGAACAGCCCCATCGCCAAGGCCGCCTTCGGCGAC
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                                                      LeuAlaPheSerAlaIleIleAlaAlaGlyIleSerGlyIleGluGluLysLeuGluLeu
                                                                                                               ProProProAlaSerGlyAsnValTyrAsnAspLysGluLeuProGluPheProAsnSer
                                                                                                                                                   8042183 cccsaggccrgcgcgggcaaccraccrac---gccgccgagracgagcacgccacc
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Matches:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence 1, Application US/10062458 Publication No. US20030003550A1 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT: IZUI, HIROSHI
APPLICANT: MORIGUCHI, KAYO
APPLICANT: KAWASHIMA, HIROKI
APPLICANT: NAKAMATSU, TSUYOSHI
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LOCATION: (2006)..(5200)
OTHER INFORMATION:
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LOCATION: (659)...
OTHER INFORMATION:
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8041832 CACCTGTCGCCGGACGCGGAC.---GGCACCAACGCCATGGCCGGCGACCCGGC 8041888
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                                                    AspGluLeuAsnAsnLeuIleArgAsnGlyLysIleAspThrValValLeuAlaCysVal 25
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                                                                                                                               AspMetGlnGlyArgLeuMetGlyLysArgLeuThrGlyArgHisPheLeuGlyLeuAsp
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             390 TyrAsnAspLysGluLeuProGluPheProAsnSerLeuGlnAsnAlaThrHisLeuLeu
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Matches:
Conservative:
Mismatches:
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CURRENT APPLICATION NUMBER: US/09/738,626
CURRENT FILING DATE: 2000-12-18
PRIOR PEDLICATION NUMBER: US/09/37484
PRIOR FILING DATE: 1999-12-16
PRIOR APPLICATION NUMBER: JP 00/159162
PRIOR FILING DATE: 2000-04-07
PRIOR FILING DATE: 2000-04-07
PRIOR FILING DATE: 2000-06-03
NUMBER OF SEQ ID NOS: 7059
SOFTWARE: Patentin ver. 3.0
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TITLE OF INVENTION: NOVEL POLYNUCLEOTIDES
                                                                                                                                                                                                                                                                                                           Sequence 2442, Application US/09738626
Publication No. US20020197605A1
GENERAL INFORMATION:
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ANDO, SEIKO
HAYASHI, MIKIRO
OCHIAI, KEIKO
YOKOI, HARUHIKO
TATEISHI, NOOKO
SENOH, AKIHIRO
IKEDA, MASATO
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Matches:
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                                                                                          Sequence 12, Application US/09733383
Patent No. US20010014467A1
GENERAL INFORMATION:
APPLICANT: Narbad Arjan
APPLICANT: Rhodes, Michael J.C.
APPLICANT: Gasson, Michael J.C.
                                                                                                                                                                                                                                                                                                                                                                                                                     TYPE: DNA ORGANISM: Pseudomonas fluorescens
                                                                                                                                                                APPLICANT: Rhodes, Michael J.C. APPLICANT: Gasson, Michael J. APPLICANT: Walton, Nicholas J. TITLE OF INVENTION: PRODUCTION
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Matches:
                              APPLICATION NUMBER: 09/733,383
FILING DATE: 2000-12-07
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         FILING DATE: 1998-09-22
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SOFTWARE: Patentin Ver. 2.1
SEQ ID NO 12
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TCGTTCTCTATCGAAGGGCCAACGAATTCGACCGCTGTTCGAAGACGTCTACGACTGG 989
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                                                                                                                                                                                                       GluLeuAsnPheValProAlaAspProLeuThrMetAlaAspArgHisIleIleAlaLys
                                                                                     LeuGluGluAlaGlyIleLeuMetGluAlaThrHisProGluPheLeuProSerGlnHis
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APPLICANT: Gasson, Michael John
APPLICANT: Walton, Micholas John
ITLE OF INVENTION: PRODUCTION OF p-HYDROXYBENZOIC ACID
FILE REFERENCE: 20747/1.03
CURRENT PRIZICATION NUMBER: US/10/199,405
CURRENT FILING DATE: 2002-07-17
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PRIOR APPLICATION NUMBER: GB96/06187
PRIOR FILING DATE: 1996-03-23
PRIOR APPLICATION NUMBER: PCT/GB97/00809
PRIOR FILING DATE: 1997-03-24
PRIOR APPLICATION NUMBER: 09/155,183
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Publication No. US20030167511A1
GENERAL INFORMATION:
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Mismatches:
Indels:
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Matches:
SOFTWARE: FastSEQ for Windows Version
                                                                  TYPE: DNA ORGANISM: Streptococcus pneumoniae
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44.80%
27.18%
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Best Local Similarity:
Query Match:
DB:
                                                                                                                                                                  ; LOCATION: (1).
US-09-815-242-9280
                                                                                                                                            NAME/KEY: CDS
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                   SEQ ID NO 9280
LENGTH: 1347
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                                              1170 ATGACCGGCGAGCCTGGCAGCGCCATGCACCTGCACCAGAGCATCATCGATATCGAGACC 1229
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                                                                                             GluLysAsnAlaPheTyrAspGlnAsnAspGluTyrGlyMetSerThrLeuAlaArgAsn
  SerSerThrAlaLeuGlyAsnAlaCysHisIleHisMetSerLeuGlnAspAlaGluThr
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APPLICANT: Tranick, John D.
APPLICANT: Tranick, John D.
APPLICANT: Yamamoto, Robert T.
APPLICANT: Yamamoto, Robert T.
APPLICANT: Yamamoto, Robert T.
APPLICANT: Xu. H. Howard
TITLE OF INVENTION: Identification of Essential Genes in
TITLE OF INVENTION: Prokaryotes
FILE REFERENCE: ELITRA.011A
FILE REFERENCE: ELITRA.011A
FILE REPERENCE: E. 2001-03-21
PRIOR APPLICATION NUMBER: 60/201,078
PRIOR FILING DATE: 2000-05-23
PRIOR FILING DATE: 2000-05-24
PRIOR FILING DATE: 2000-05-26
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR FILING DATE: 2000-05-26
PRIOR PILING DATE: 2000-10-23
PRIOR FILING DATE: 2000-10-23
PRIOR FILING DATE: 2000-10-23
PRIOR FILING DATE: 2000-11-27
PRIOR FILING DATE: 2000-11-27
PRIOR FILING DATE: 2000-11-27
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Patent No. US2002061569A1
GENERAL INFORMATION:
APPLICANT: Haselbeck, Robert
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APPLICATION NUMBER: 60/269,308
FILING DATE: 2001-02-16
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Zyskind, Judith W.
Wall, Daniel
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                                                                                 AsnAlaPheTyrAspGlnAsnAspGluTyrGlyMet----SerThrLeuAlaArgAsn 290
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AACGCCTTCTTTGATCCAAATGATCCAAAGGAATGCAGTTGTCAGAAACAGCTTACCAT
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APPLICANT: OWURA, SATOSHI
APPLICANT: IKEDA, HARUO
APPLICANT: ISHIKAWA, JUN
APPLICANT: ISHIKAWA, JUN
APPLICANT: SHIKAWA, HIROSHI
APPLICANT: SHIRA, HARUO
I APPLICANT: SHIRA, TADAYOSHI
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APPLICANT: SHIRA, TADAYOSHI
APPLICANT: OSHIRA
ITILE OF INVENTION: NOVEL POLYNUCLEOTIDES
FILE REFERENCE: 29-262
CURRENT APPLICATION NUMBER: US/10/156,761
CURRENT FILING DATE: 2001-05-30
PRIOR APPLICATION NUMBER: JP 2001-272697
PRIOR FILING DATE: 2001-08-02
NUMBER OF SEQ ID NOS: 15109
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Publication No. US20030119018A1
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120 ValileLeumetGlnGlnIleGluArgLeuAlaAsnLeuLysLeuLysGlyLeu---Phe 138
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73 TTACAATTCACTGATATTTTAGGAACAATTAAAAATGTTGAAGTGCCTGTAAGCCAATTA 132
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133 ------GAAAAAGTACTIGATAACGAAATGATGTTTGACGGTTCTTCTATCGAA 180
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|GOAGGIGIACTTAAAAATGCACGCGGATTTACTGCTGTATGTAACCGGTTAGTAAACTCA 891
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772 AATGCATTCTTCGATCCAAATACTGAAATGGGCTTAACGGAAACTGCATATCAATTTACA
                                                                                    13 ACTITCACTAAAGACGACATTCGTAAATTTGCAGAAGGGAAAATGTAAGATATTTAAGA
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US-10-098-602A-2 (1-454) x US-09-815-242-4678 (1-1338)
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                                                                                                                                       1276 TTCCTGCGCAACAAGAAGCAGGÁGTGGGAGGÁGTACCGCTCCGAGGTGÁCGGCCTTCGÁG 1335
                                                                                                                                                                                                  392 AspLysGlu-------LeuProGluPheProAsnSerLeuGlnAsnAlaThr 406
                                                                                                                                                                                                                                                                                       407 HisleuleulysGluSerlysMetLeuAsnLysThrPheGlyGluLysLeuIleLeuHis 426
                      354 GlyGlyAlaAspLeuAsnProTyrLeuAlaPheSerAlaIleIleAlaAlaGlyIleSer 373
                                                                                                             GlyIleGluGluLysLeuGluLeuProProProAlaSerGlyAsnValTyr----Asn
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APPLICANT: Obleach, Kari L.
APPLICANT: Zyskind, Judith W.
APPLICANT: Tranic Daniel
APPLICANT: Tranick, John D.
APPLICANT: Tranick, John D.
APPLICANT: Tranick, John D.
APPLICANT: Yamamoto, Robert T.
APPLICANT: Yamamoto, Robert T.
APPLICANT: Xu, H. Howard
TITLE OF INVENTION: Identification of Essential Genes in
TITLE OF INVENTION: Identification of Essential Genes in
TITLE OF INVENTION: 1000-101-03-21
CURRENT FILING DATE: 2000-03-21
PRIOR APPLICATION NUMBER: 60/191,078
PRIOR APPLICATION NUMBER: 60/206,848
PRIOR PILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-10-23
PRIOR FILING DATE: 2000-11-27
PRIOR PILING DATE: 2000-11-27
PRIOR FILING DATE: 2000-11-22
PRIOR FILING DATE: 2000-11-22
PRIOR FILING DATE: 2000-12-22
PRIOR FILING DATE: 2001-12-22
PRIOR FILING DATE: 2000-12-22
PRIOR PELING DATE: 2000-12-22
PRIOR FILING DATE: 2000-12-22
PRIOR FILING DATE: 2000-12-22
PRIOR FILING DATE: 2000-12-22
PRIOR FILING DATE: 2001-02-16
NUMBER OF SEQ ID NOS: 14110
SSOFTWARE: FREESEQ FOR WINDOWN VERSION 4.0
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Matches:
Conservative:
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Patent No. US20020061569A1
GENERAL INFORMATION:
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APPLICANT: Ohlsen, Kari L.
APPLICANT: Zyskind, Judith W
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LENGTH: 1338
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Query Match: 17.87% Indels: 43 DB: 9 Gaps: 9 US-10-098-602A-2 (1-454) x US-09-815-242-8240 (1-1341) Qy 2 Thr11eThrTyrAspGluLeuAsnAsnLeu1leArgAsnGlyLyselleAspThrValVal 21 Qy 2 ThrTcACTAAAGACGACATTCGTAAATTTGCAGAAGAGGAAAATTTAAGA 72 Qy 22 LeuAlaCysValAspMetGlnGlyArgLeuMetGlyLysAxrgLeuThrGlyArgHisPhe 41	Db 73 TACAATTCACTGAACTATTTTAGGAACAATTAAAAATGTTGAAGTGCCTGTAAGCCAATTA 132 Qy 42 LeuGlyLeuAepGlnLysLysLiserileSerThrPheValTyrAlaValThrIleGlu 61 Db 133GAAAAGTACTTGATAACGAAATGATGTTTGACGGTTCTTCTATCGAA 180	Qy 62 Gly1leAlaGlyGlyTyTGluIleSerSerValAspThrGlyTyTserAspCysHis 81	Db 214 TTACATCCAGATTTAGGTAATCTTCCCATGGACAGGTAAAGTT 273 Oy 100 LeuAlaileSerAsnProHisAsnPheValThrSerGluProLeuPheCysSerProArg 119 Db 274 GCACGTTTAATTTGTGATGTAAAACAGATGGTACACCATTGAAGGGGATCCTCGT 333	120 ValileLeuMetGinGinileGluArgLeuAlaAsnLeuLysLeuLysGlyLeuPhe :: ::::: ::: ::: 334 GCAAACTTAAAAGAAATGGAAGATTTAGGCTTCACAGACTTTAACCTA 139 AlaSerGluLeuGluPheAsnLeuPheAsnGluThTTYrLysSerAlaSerGlnLysHis	DD 394 G45CCTGAACCAGAATTCTTCTTGTTTAGTTGGATGAAAA	Oy 173 AsnIleSerAlaSerSerGlyIleGluThrPheMetArgSerValargAsnLysLeuGlu 192	538 GATTTAAATATGGGCTTGGATTATGAGGCTAGTGAGGTTGGCCCTGGTGGAATT 213 AsnPheValProAlaAspProLeuThrMetAlaAspArgHis1le1leAlaiySHisGly :::	Qy 233 ValArgGluMetAlaGluGlnSerGlyMetValAlaThrPheMetAlaLysLeuSerSer 252	273 AsnalaPheTyrAspGlnAsnAspGluTyrGlyMetSerThrLeuAlaArgAsnTrpIle 273 AsnalaPheTyrAspGlnAsnAspGluTyrGlyMetSerThrLeuAlaArgAsnTrpIle 272 AsnaCaTCCTACCAATCCGAAATGGGCTTAACGGAAACTGGAAATTACA 293 AlaGlyLeuLeuLysTyrValProGluAlaThrTyrPhePheAlaSerTyrIleAsnSer 293 AlaGlyLeuLeuLysTyrValProGluAlaThrTyrPhePheAlaSerTyrIleAsnSer 293 AlaGlyLeuLeuLysTyrValProGluAlaThrTyrPhePheAlaSerTyrIleAsnSer 293 AlaGlyLeuLeuLysTyrValProGluAlaThrTyrPhePheAlaSerTyrIleAsnSer	313 TyrLysArgLeuGlnProLeuThrPheAlaProThrLysCysTrpAlalleAspAsn 313 TyrLysArgLeuGlnProLeuThrPheAlaProThrLysCysCysTrpAlalleAspAsn 313 TyrLysArgLeuGlnProLeuThrPheAlaProThrLysCysCysTrpAlalleAspAsn 313 TyrLysArgLeuGlnProLeuThrPheAlaProThrLysCysTrpAlalleAspAsn 313 TyrLysArgLeuGlnProLeuThrPheAlaProCysTraThrIntyleCysTrpAlalleAspAsn 313 TyrLysArgLeuGlnProLeuThrPheAlaProCysTrpAlalleAspAsn 314 TyrLysArgLeuGlnProLeuThrPheAlaProCysTrpAlalleAspAsn 315 TyrLysArgLeuGlnProLeuThrPheAlaProCysTrpAlalleAspAsn 317 TyrLysArgLeuGlnProLeuThrPheAlaProCysTrpAlalleAspAsn 318 TyrLysArgLeuGlnProLeuThrPheAlaProCysTrpAlalleAspAsn 319 TyrLysArgLeuGlnProLeuThrPheAlaProThrPheAlaProCysTrpAlalleAspAsn 319 TyrLysArgLeuGlnProLeuThrPheAlaProCysTrpAlalleAspAsn 310 TyrLysArgLeuGlnProLeuThrPheAlaProCysTrpAlalleAspAsn 311 TyrLysArgLeuGlnProLeuThrPheAlaProCysTrpAlalleAspAsn 312 TyrLysArgLeuGlnProLeuThrPheAlaProCysTrpAlalleAspAsn 313 TyrLysArgLeuGlnProLeuThrPheAlaProCysTrpAlalleAspAsn 314 TyrLysArgLeuThrPheAlaProCysTrpAlalleAspAsn 315 TyrLysArgLeuThrPheAlaProCysTrpAlalleAspAspAsn 315 TyrLysArgLeuThrPheAlaProCysTrpAlalleAspAspAsn 315 TyrLysArgLeuThrPheAlaProCysTrpAlalleAspAspAsn 315 TyrLysArgLeuThrPheAlaProCysTrpAlalleAspAspAsn 315 TyrLysArgLeuThrPheAlaProCysTrpAlalleAspAspAsn 315 TyrLysArgLeuThrPheAlaProCysTrpAlalleAspAspAsn 315 TyrLysArgLeuThrPheAlaProCysTrpAlalleAspAspAspAspAspAspAspAspAspAspAspAspAspA
Qy 353 IleGlyGlyAlaAspLeuAsnProTyrLeuAlaPheSerAlaIleIleAlaAlaGlyIle 372 Db 1012 TCAGTAGATCCAGCTGCAACCCATACATGGCGTTAGCTGCAATCTTAGAAGCTGGACTA 1071 Qy 373 SerGlyIleGluGluLySLeuGluLeuProProProPalaSerGlyAsnValTyr 390 Internal of the control of the	Db 1132 AACGTGAAGACGTGAAGCATAGAGATTCAAGACTTACCTTATTACTUT	Qy 426 HisTyrValAsnAlaAsnValGluIleAsnGluPheSerLysGlnValThrAspTrp 445 .:::: :::: .:: Db 1252 CAATTTATTAATTCAAATTGAATGGGATTACTACAGAACTCAAGTATCTGAATGG 1311 Qy 446 GluLeuAsnGlnGlyPheAsnArgTyr 454	Db 1312 GAAAGAGATCAGTACATGAAGCAATAT 1338 RESULT 11 US-09-815-242-8240, Application US/09815242	; Pacen No. US20020061569A1 ; GENERAL INFORMATION: ; APPLICANT: Haselbeck, Robert ; APPLICANT: 2yekind, Undith W. ; APPLICANT: Wall, Daniel ; APPLICANT: Wall, Daniel	555	CURRENT APPLICATION NUMBER: US/09/815,242 CURRENT FILING DATE: 2001-03-21 PRIOR APPLICATION NUMBER: 60/191,078 PRIOR FILING DATE: 2000-03-21 PRIOR APPLICATION NUMBER: 60/266.848	FILING DATE: 2000-00 APPLICATION NUMBER: FILING DATE: 2000-00 APPLICATION NUMBER: FILING DATE: 2000-10 APPLICATION NUMBER:	24.43		Alignment Scores: 2.62e-44 Length: 1341 Pred. No.: 2.62e-44 Length: 1341 Score: 42.4.50 Matches: 123 Percent Similarity: 45.84* Conservative: 92 Best Local Similarity: 26.23* Mismatches: 211

ore: rcent Simila st Local Sim ery Match: :			Qy 42 LeuGlyLeuAspGlnLysLysIleSerTleSerThrPheValTyrAlaValThrIleGlu 61 	Qy 62 GlylleAlaGlyGlyTyrGluIleSerSerValAspThrGlyTyrSerAspCysHis 81	Oy 82 LeuCysAlaAspLeuAsnSerLeuHisLeuLeuProTrpSerGluGlyAlaVal 99	Qy 100 LeualaileSerAsnProHisAsnPheValThrSerGluProLeuPheCysSerProArg 119	Qy 120 ValileLeuMetGlnGlnileGluArgLeuAlaAsnLeuLysLeuLysGlyLeuPhe 138	Qy 139 AlaSerGluLeuGluPheAsnLeuPheAsnGluThrTyrLysSerAlaSerGlnLysHis 158	Qy 159 TrpLysAsnLeuLysThrAlaGlnPrOHisHisGlnTrpMet 172 1	Qy 173 AsnileseralaserserglyilegluthrPheMetargserValargAsnLysLeuglu 192	Qy 193 GlualaGlyIleLeuMetGlualaThrHisProGluPheLeuProSerGlnHisGluLeu 212 :::	Qy 213 AsnPheValProAlaAspProLeuThrMetAlaAspArgHisIleIleAlaLy8HisGly 232	Qy 233 ValargGluMetAlaGluGlnSerGlyMetValAlaThrPheWetAlaLy8LeuSer 252	Oy 7.253 ThralaLeuGlyAenalaCysHisIleHisMetSerLeuGlnAspalaGluThrGluLys 272	Qy 273 AsnalaPheTyrAspGlnAsnaspGluTyrGlyMetSerThrLeualaArgAsnTrpIle 292	Oy 293 AladlyLeuLeuLysTyrValProGluAlaThrTyrPhePheAlaSerTyrIleAsnSer 312	313 TyrLysArgLeuGlnProLeuThrPheAlaProThrLysCysTrpAlalleAspAsn
333 ArgThrSerAlaPheArgLeuCysAsnSerLysSerGluGlylleAsnValGluLeuArg 3	<pre>Qy 373 SerGIVILeGIUGULVeLeuGIULeuEroProProAlaSerGIyAshValTyr 390 :: ::: ::: Db 1072 GATGGTATTAAAATTAAAAGTTCCAGAACCAGTTAACCAAATATTACGAATG 1131 Qy 391 AshAspLygGluLeuProGluPheProAshSerLeuGlnAshAla 405</pre>	::: :::: :::	Qy 406 ThrHisbeuleysGluSerlysMetLeuAsnLysThrPheGlyGluLysLeulleLeu 425 	Qy 426 HisTyrValasnalaalaAsnValGluIleAsnGluPheSerLysGlnValThrAspTrp 445 :::::: :::: :::: Db 1252 CAATTTATTAATTCAAATCAATTGAATGGGATTACTACAGAACTCAAGTATCTGAATGG 1311	Qy 446 GluLeuAsnGlnGlyPheAsnArgTyr 454 :::	RESULT 12 US-09-815-242-8677 ; Sequence 8677, Application US/09815242	; FACERT NO. USZUOZOBISESAL ; GENERAL INFORMATION: ; APPLICANT: Haselbeck, Robert ; APPLICANT: Ohlsen, Kari L.		 APPLICANT: Xu, H. Howard TITLE OF INVENTION: Identification of Essential Genes in TITLE OF INVENTION: Prokaryotes 	; FILE KEFEKENCE: ELLIFA.011FA.01FA.0	; FALOR FILLING DATE: 2000-03-71 ; PRIOR FILLING DATE: 2000-05-23 ; PRIOR FILLING DATE: 2000-05-23 ; PRIOR APPLICATION UMBER: 60/207,727		API	; PRIOR FILING DATE: 201-02-16; ; NUMBER OF SEQ ID NOS: 14110; SOFTWARE: FastSEQ for Windows Version 4.0; SEQ ID NO 8677	-i ⊲	; NAME/KRY: CDS ; LOCATION: (1)(1341) US-09-815-242-8677	Alignment Scores: 2.62e-44 Length: 1341

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| GCTTGGAGCGGCAGAAATCGTTCACCACTCATTCGAGTTCCTGAATCTCGTGGTTTAATCG 1008
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                                                                                                                                                                                                                                              307 AlaSerTyrIleAsnSerTyrLysArgLeuGlnProLeuThrPheAlaProThrLysCys 326
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                                                                                                                                                                                                                                                                                                      ---AlaValLeuAlaIleSerAsnProHisAsnPheValThrSer 111
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277 CATGGAAAAGTTGCGCGCTTAATTTGCGATATTTACAATCCT----
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                                                                                  Conservative:
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                                           Length:
Matches:
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| CGTTCACCATTAATCCGTGTACCATCTTCAAGAGATTATCTACTCGTATCGAAGTACGT 1011
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                                                                                                                                                                                                                                          406 ThrHisLeuLeuLysGluSerLysMetLeuAsnLysThrPheGlyGluLysLeuIleLeu 425
                                                                                                                                                                                                                                                                                                                                                                                                                   1192 TTAAAAGCAATGCGTGAAATGAAGTTATTAAAAAGCTTTAGGAAATCATATCTATAAT 1251
                                                                                                                                       353 IleGlyGlyAlaAspLeuAsnProTyrLeuAlaPheSerAlaIleIleAlaAlaGlyIle 372
                                                                                                                                                                                                                                                                                                  AsnAspLysGlu-------LeuProGluPheProAsnSerLeuGlnAsnAla 405
333 ArgThrSerAlaPheArgLeuCysAsnSerLysSerGluGlyIleAsnValGluLeuArg
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APPLICANT: Oblean, Kari L.
APPLICANT: Zyekind, Judith W.
APPLICANT: Trainiel, Daniel
APPLICANT: Trainiel, Daniel
APPLICANT: Trainiel, Judith W.
APPLICANT: Trainiel, John D.
APPLICANT: Yamamoto, Robert T.
APPLICANT: Yamamoto, Robert T.
APPLICANT: Xu, H. Howard
TITLE OF INVENTION: Identification of Essential Genes in
TITLE OF INVENTION: Prokaryotes
TITLE OF INVENTION: Prokaryotes
TITLE OF INVENTION: Prokaryotes
TITLE OF INVENTION: Prokaryotes
TITLE OF INVENTION: Prokaryotes
TITLE OF INVENTION NUMBER: 00/19, 078
PRIOR APPLICATION NUMBER: 00/20, 948
PRIOR FILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-11-27
PRIOR FILING DATE: 2000-11-27
PRIOR FILING DATE: 2000-11-22
PRIOR FILING DATE: 2000-12-22
PRIOR FILING DATE: 2000-12-22
PRIOR FILING DATE: 2001-02-16
NUMBER OF SEQ ID NOS: 14110
SSOFTWARE: RESESED FOR Windows Version 4.0
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Patent No. US20020061569A1
GENERAL INFORMATION:
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; LOCATION: (1)...(1356)
US-09-815-242-6417
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10 Gaps: 7	10-098-602A-2 (1-454) x US-09-070-927A-188 (1-4176)	78 SerAspCysHisLeuCysAlaAspLeuAsnSerLeuHisLeuLeuProTrpSerGluGly 97	308 AGIGACATGTATTATACCCTGACCTATCTACATGGATGATTTTTCCGTGGGAAAGCGAC 367	98AlaValLeuAlaIleSerAsnProHisAsnPheValThrSer 111	368 CATGGAAAAGTTGCGCGCTTAATTTGTGATATTTACAATCCTGATGGT 415	112 GluProLeuPheCysSerProArgValIleLeuMetGlnGlnIleGluArgLeuAlaAsn 131	416 ACCCCTTTTGCCGGAGATCCCCGC	132 LeuLysLeuLysGlyLeuPheAlaSerGluLeuGluPheAsnLeuPheAsin 148	446 TIAAAACGCGCCTIAGCAGATATGAAAGAATTAGGCTTTACTTCTTTAACTTAGGACCA 505	149GluThrTyrLysSerAlaSerGlnLysHisTrpLysAsnLeuLysThrAlaGln 166	506 GAACCAGAATTTTTCCTATTTAAATTAGATGGGAAATTACCACTGACTTGAAT 565	167 ProHisHisGlnTrpMetAsnIleSerAlaSerSerGlyIleGluThrPheMetArgSer 186	566 GATAAAGGTGGCTATTTTTGATTTTGCACCAACCGATTTAGGTGAAAATTGTCGCCGTGAT 625	187 ValArgAsnLysLeuGluGluAlaGlyIleLeuMetGluAlaThrHisProGluPheLeu 206	626 ATTCTTTTAGAGGTTAGGCTTTGAGGTGGAAGCTTCACATCATGAAGTAGCA 685	207 ProSerglnHisGluLeuAsnPheValProAlaAspProLeuThrMetAlaAspArgHis 226		227 IlelleAlaLyBHibGlyValArgGluMetAlaGluGlnSerGlyMetValAlaThrPhe 246		247 MetAlaLygLeuSerSerThrAlaLeuGlyAsnAlaCysHislleHisMetSerLeuGln 266	806 ATGCCAAAACCTTTGTTTGGAATTAATGGTTCTGGTATGCACTGCAATATGTCATTA 862	267 AspAlaGluThrGluLysAsnAlaPheTyrAspGlnAsnAspGluTyrGlyMetSerThr 286		287 LeuAlaArgAsnTrplleAlaGlyLeuLeuLygTyrValProGluAlaThrTyrPhePhe 306	920 ACTGCGTATCATTCTTAGGTGGTTTATTAAAACATGCCCGTGCCTATACTGCGGTATGT 979	307 AlaSerTyr1leAsnSerTyrLysArgLeuGlnProLeuThrPheAlaProThrLysCys 326	980 AACCCAACAGTGAACTCTTATAAACGCTTGGTACCAGGTTATGAAGCACCTGTTTATGTA 1039	327 CysīrpalalleAspAsnArgThrSerAlaPheArgLeuCysAsnSerLysSerGluGly 346	::: 1040 GCTTGGAGCGGCAGAATCGTTCACCACTCATTCGAGTTCCTGAATCTCGTGGKTTATCG 1099	347 TleAsnValGluLeuArdIleGlvGlvAlaAspLeuAsnProTvrLeuAlaPheSerAla 366	ACTOCITIAGANTIACGITCIGICALCOTTCAGCGAATCCGIAITIAACAAIGGCIGIC	367 ileilealaalaGlyileSerGlyileGluGluLysheuGlubeuproproalaSer 386	1160 TTATTACAAGCAGGTTTGGATGGTATTCGTAATGAACTTACACCGCCAGCAGTTGAT 1219	387 GlyAsnValTyrAsnAspLysGlu	1220 CGTAACATTTATGTGATGAAGAAGAACGTCAACATGCACAAATTGAAGATTTGCCA 1279	400 AsnSerLeuGlnAsnAlaThrHisLeuLeuLysGluSerLysMetLeuAsnLysThrPhe 419
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TTATTACAAGCTGGTTTGGATGGTATTCGTAATGAACTTACGCCACCGCCAGCA	AsnAspLysGlu	:: CGTAATATTTATGTGATGAAGGAAGGTCAACATGCACAAATTGAAGATTTGCCA	AsnSerLeuGlnAsnAlaThrHisLeuLeuLysGluSerLysMetLeuAsnLysThrPhe		GlyGluLysLeuIleLeuHisTyrValAsnAlaAlaAsnValGluIleAsnGlu		LysGlnValThrAspTrpGluLeuAsnGlnGlyPheAsnArgTyr	CAPACCGTTTCTGAATGGGAAAGAGAACAATATTTGGAGTTGTAC		09070927A		kunscn Dillon	sn terococcus faecialis Poly	NUMBER OF SEQUENCES: 982 CORRESPONDENCE ADDRESS:	Genome Sciences, Inc. West Avenue			BLE FORM: PE: Diskette, 3.50 inch, 1.4Mb storage	ra 486/33 MSDOS version 6.2	ext TA:	R: US/09/070,927A ay-2000	Unknown> :	R: 60/046,655 -05-16	R: 60/044,031 -05-06	R: 60/066,009 -11-14	TION:	EK: 40,302 NUMBER: PB369	N INFORMATION: (301) 309-8504	9-8512 188:	CS:	d d ble	SEQ ID NO: 188:		Length:	tive:	
1069 TTATTACAAGCTGGTTTC	387 GlyAsnValTyr	::: 1129 CGTAATATTTATGTGATC	400 AsnSerLeuGlnAsnAla	1189 TCAACCTTACACAATGC	420 GlyGluLysLeuIleLeu	1249 GGTCGTCATATTTTGCC	440 LysGlnvalThrAspTr	1309 CAAACCGTTTCTGAATGC		-09-070-92/A-188 Sequence 188, Application US/09070927A	L INFORMATION:	AFFLICANI: Charles A. Kunsch Patrick J. Dillon	Steven Barash ITLE OF INVENTION: Enter	UMBEK OF SEQUENCES: 90 ORRESPONDENCE ADDRESS:	c >-	CITY: Rockville STATE: Maryland	COUNTRY: USA ZIP: 20850	COMPUTER READABLE FORM: MEDIUM TYPE: Diske	COMPUTER: HP Vectra 486/33 OPERATING SYSTEM: MSDOS version	SOFTWARE: ASCII TEXT CURRENT APPLICATION DATA:	APPLICATION NUMBER: US/09/070,927A FILING DATE: 04-May-2000	CLASSIFICATION: <unknown> PRIOR APPLICATION DATA:</unknown>	APPLICATION NUMBER: 60/ FILING DATE: 1997-05-16	APPLICATION NUMBER: 60/044,031 FILING DATE: 1997-05-06	APPLICATION NUMBER: 60/ FILING DATE: 1997-11-14	ATTORNEY/AGENT INFORMATION: NAME: Kenley K. Hoover	REGISTRATION NUMBER: 40,302 REFERENCE/DOCKET NUMBER: PB369	8	TELEFAX: (301) 309-8512 INFORMATION FOR SEQ ID NO: 188:	SEQUENCE CHARACTERISTICS:	TYPE: nucleic acid STRANDEDNESS: double	LOGY: linear DESCRIPTION:	927A-188	Scores: 1.57e-40	Section: 402.00 Percent Similarity: 44.81%	••
Db 10	ò	Db 1.	È	Db 1	ò	Db 1	ò	Db 1	RESULT 14	US-09-070-927A-188	GENERA	σ		Z Ü		•• ••	٠									« 			; INFORM	·		· · · ·		Alignment Pred. No.:	Percent Si	Query Match:

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321 PheAlaProThrLysCysCysTrpAlaIleAspAsnArgThrSerAlaPheArgLeuCys 340
                                                                                                                                                                                                                           381 LeuProProProAlaSerGlyAsnValTyr--------AsnAspLys 393
                                                                                                                                                                                                                                                                                                   394 GluLeuProGluPheProAsnSerLeuGlnAsnAlaThrHisLeuLeuLysGluSerLys 413
                                                                                                                                                                                                                                                                                                                          MetLeuAsnLysThrPheGlyGluLysLeuIleLeuHisTyrValAsnAlaAlaAsnVal 433
                                                                                                                                                                                                                                                            765 GCACCGGCTCCGATCGAACATCTATGTCATGACAAAAGAAGAGGGCGCCTCGAAAAC 824
                                    585 GAAGCACCTTGCTATGTGGCATGGAGCGCGCAAAACAGAAGCCCGTTAATCCGCATCCCG
                                                                                                                                                    TyrieuAlaPheSerAlaIleIleAlaAlaGlyIleSerGlyIleGluGluLysLeuGlu
                                                                                                                                                                       341 AsnSerLysSerGluGlyIleAsnValGluLeuArgIleGlyGlyAlaAspLeuAsnPro
                                                                                                  434 GlulleAsnGluPheSerLysGlnValThrAspTrpGluLeuAsnGlnGlyPheAsnArg
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GGTCGTCATATTTTGCCAATTTTGTAGAAGCGAAACGAATGGAATGGGCAGCCTTCCGT 1399
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GlyMetValAlaThrPheMetAlaLysLeuSerSerThrAlaLeuGlyAsnAlaCysHis 260
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TGCAATCTATCACTC-----TTCCGAAACGGCGCCAACGCCTTCTTGACAAAGACGCC 464
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                                                                                                                                                      1400 CAAACCGTTTCTGAATGGGAAAGAGAACAATATTTGGAGTTGTAC 1444
                                                                                                                           440 LysGlnValThrAspTrpGluLeuAsnGlnGlyPheAsnArgTyr 454
                                                                                                                                                                                                                                   Sequence 261, Application US/09974300
; Sequence 261, Application US/09974300
; Patent No. US20020146721A1
; GENEBAL INPORMATION:
; APPLICANT: Clausen, Ib Groth
; TITLE OF INVENTION: Methods For Monitoring Multiple Gene
; TITLE OF INVENTION: Expression
; FILE REFERENCE: 10085.500-US
; CURRENT APPLICATION NUMBER: US/09/974,300
; CURRENT FILING DATE: 2001-10-05
; PRIOR FILING DATE: 2001-0-06
; PRIOR FILING DATE: 2000-10-06
; PRIOR FILING DATE: 2000-13-0-06
; PRIOR FILING DATE: 2000-13-0-06
; RIOR FILING DATE: 2000-13-0-06
; ROMBER OF SEQ ID NOS: 8481
; SOFTWARE: FastSEQ for Windows Version 4.0
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Matches:
Conservative:
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33.45%
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US-09-974-300-261
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US-09-974-300-261
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Pred. No.:
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Sequence 1, Apprasequence 2239, Ap
 Sequence 151, App
Sequence 1336, Ap
Sequence 1145, A
Sequence 1, Appli
Sequence 19, Appl
Sequence 10119, A
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Sequence 1, Appli
Sequence 2330, Ap
Sequence 2389, Ap
Sequence 216, App
Sequence 216, App
Sequence 9963, Ap
Sequence 16240, Ap
                                                                                                        Sequence 225, App
Sequence 11261, A
Sequence 2443, Ap
Sequence 197, App
Sequence 1197, App
Sequence 1197, App
Sequence 1196, A
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Patent No. 6294328
GENERAL INFORMATION.
APPLICANT: FLEISCHMAN, Robert D.
APPLICANT: FLEISCHMAN, Robert D.
APPLICANT: FRASER, Claire M.
APPLICANT: VENTER, John C.
TITLE OF INVENTION: TUBERCULOSIS
FILE REFERENCE: 24366-20007.00
CURRENT APPLICATION NUMBER: US/09/103,840A
CURRENT APPLICATION NUMBER: US/09/103,840A
NUMBER OF SEQ ID NOS: 2
SOFTHARE: PATENTIN OF: 2.1
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US-09-252-991A-2309

US-09-252-991A-1630

US-09-252-991A-1630

US-09-252-991A-1630

US-09-252-991A-1639

US-09-252-991A-11057

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-09-252-991A-208
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Matches:
Conservative:
Mismatches:
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799.50
58.02%
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OTHER INFORMATION: "n" bases
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   1830121
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Best Local Similarity:
   SEQ ID NO 2
LENGTH: 4403765
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US-09-103-840A-2/c
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   FEATURE:
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-WODEL=frame+_p2n.model -DEV=xlh
-Q=/CQm1_1/USPPTO spool/USIO098602/runat 17122003 151238 28076/app_query.fasta_1.647
-Q=/CQm2_1/USPPTO spool/USIO098602/runat 17122003 151238 28076/app_query.fasta_1.647
-DB=ISGUEG_PARPPTO spool/USPTO START=1 -NDE-1 -MATRIX=blosum62 -TRANS=humans0.cdi
-LOOPEXT=0 -UNITS=bits -START=1 -ENDE-1 -MATRIX=blosum62 -TRANS=humans0.cdi
-LIST=45 -DOCALIGN=200 -THR SCORE=pct -THR MAX=100 -THR MIN=0 -ALIGN=15
-MODE-LOCAL -OUTFMT=pto -NORM=ext -HEAPSIZE=500 -MINIEN=0 -MAXEN=200000000
-USER=USI0098602 @CGN 1 1.56 @vunat 17122003 151238 28076 -NCPU=6 -ICPU=3
-NO MMAP -LARGEQUERY -NEG SCORES=0 -WAIT -DSPBLOCK=100 -LONGLOG
-DBV TIMEOUT=120 -WARN_TIMEOUT=30 -THREADS=1 -XGAPOP=10 -XGAPEXT=0.5 -FGAPOP=6
-FGAPEXT=7 -YGAPOP=10 -YGAPEXT=0.5 -DELOP=6 -DELEXT=7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 2, Appli
Sequence 1330, Ap
Sequence 1310, Ap
Sequence 1279, Ap
Sequence 10926, A
Sequence 10926, A
Sequence 11477, A
Sequence 11417, A
Sequence 11262, A
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Sequence 10987, A
                                                                                                   December 17, 2003, 22:53:00 ; Search time 299 Seconds (without alignments) 670.194 Million cell updates/sec
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                                                                                                                                                                                               1 MIITYDELNNLIRNGKIDTV.....INEFSKQVTDWELNQGFNRY 454
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1: /cgn2_6/ptodact2/ina/5A_COMB.seq:*
1: /cgn2_6/ptodacta/2/ina/5B_COMB.seq:*
3: /cgn2_6/ptodacta/2/ina/6A_COMB.seq:*
4: /cgn2_6/ptodacta/2/ina/6B_COMB.seq:*
5: /cgn2_6/ptodacta/2/ina/PCTUS_COMB.seq:*
6: /cgn2_6/ptodacta/2/ina/PcTUS_COMB.seq:*
              GenCore version 5.1.6
(c) 1993 - 2003 Compugen Ltd.
                                                                      - nucleic search, using frame_plus_p2n model
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3 US-09-103-840A-1

US-09-252-991A-1330

US-09-252-991A-1285

US-09-252-991A-10926

US-09-252-991A-10926

US-09-252-991A-10986

US-09-252-991A-11417

US-09-252-991A-11417

US-09-252-991A-1162

US-09-155-183-12

US-09-252-991A-11262

US-09-155-183-12
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                                                                                                                                                                                                                                                                                                                         569978 seqs, 220691566 residues
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Ygapop 10.0, Ygapext
Fgapop 6.0, Fgapext
Delop 6.0, Delext
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Maximum Match 100%
Listing first 45 st
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seq length: 200000000
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3165847 TTCGGCGAGGATGTTGTCGCGCACTACCTGAACAACGCGCGTGTGGAGCTGGCGGCGTTC 3165788
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     3 IleThrTyrAspGluLeuAsnAsnLeuIleArgAsnGlyLysIleAspThrValValLeu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AlaCysValAspMetGlnGlyArgLeuMetGlyLysArgLeuThrGlyArgHisPheLeu
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GlylleAlaGlyGlyGlyTyrGlulleSerSerValAspThrGlyTyrSerAspCysHis
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                                                          LeuGluLeuProProAlaSerGlyAsnValTyrAsnAspLysGluLeuProGluPhe
                                                                                                                                       ProAsnSerLeuGlnAsnAlaThrHisLeuLeuLysGluSerLysMetLeuAsnLysThr
                                                                                                                                                                                                             PheGlyGluLysLeulleLeuHisTyrValAsnAlaAlaAsnValGluIleAsnGluPhe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT: FLEISCHMAN, Robert D.
APPLICANT: WHITE, Owen R.
APPLICANT: FRASER, Claire M.
APPLICANT: VENTER, John C.
TITLE OF INVENTION: DNA SEQUENCES FOR STRAIN ANALYSIS IN MYCOBACTERIUM ITLE OF INVENTION: TUBERCULOSIS
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Matches:
Conservative:
Mismatches:
Indels:
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CURRENT APPLICATION NUMBER: US/09/103,840A
CURRENT FILING DATE: 1998-06-24
SOFTWARE: PATENTIN VOS: 2
SOFTWARE: PATENTIN Ver. 2.1
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ORGANISM: Mycobacterium tuberculosis
OTHER INFORMATION: H37Rv
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; Sequence 1, Application US/09103840A
; Patent No. 6294328
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58.02%
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Best Local Similarity;
Query Match:
DB:
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                          3167086 TIGGCGTGGACCGAGTTGGAGCGACTGGTCGCGGCGGGCGGTGACGTCGACACCGTCATCGTC 3167027
                                                                                              3166966 GACGACATAGCCACCCGCGGCGTGCTGCTGATATCTGCTGGCCGTGGACGTCGAC 3166907
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |||||||:::
3166378 CAGCACGGCAAGAGCCTAACGTTCATGGCGAAATACGATGAACGCGAA---GGTAATAGC 3166322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3166321 TGTCRCATGTCTCGCTGCGTGGCACGGATGGCTCCGCG---GTGTTTGCCGACAGT 3166265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3166204 TIGCGCGAATTCACGCTGTGCTATGCGCCGACCATTAACTCCTACAAGCGATTTGCCGAT 3166145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3166144 AGCAGTTTCGCGCCGACGCGTTCGGCGCTGGACAATCGCACCTGCGCCTTGCGG 3166085
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3166084 GTGGTT---GGCCACGGGCAAAACATCCGGGTCGAATGCCGGGTTCCCGGCGGTGATGTC 3166028
                                                                                                                                                                                                                                                                         3166906 CTGAACACGGTGCCCGGCTATGCGATGGCCAGTTGGGACACCGGCTACGGCGATATGGTG 3166847
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3166618 TATCGCGGGCTGACCCCGGCCAGCGACTACAACATCGACTACGCGATATTGGCATCCTCG 316559
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AlaSerGluLeuGluPheAsnLeuPheAsnGluThrTyrLysSerAlaSerGlnLysHis 158
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LeuMet GlnGinIleGluArgLeuAlaAsnLeuLysLeuLysGlyLeu-----Phe 138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                219 ProLeuThrMetAlaAspArgHisIleIleAlaLysHisGlyValArgGluMetAlaGlu 238
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CysHisIleHisMetSerLeuGlnAspAlaGluThrGluLysAsnAlaPheTyrAspGln 278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AsnAspGluTyrGlyMetSerThrLeuAlaArgAsnTrpIleAlaGlyLeuLeuLysTyr 298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LeuCysAsnSerLysSerGluGlyJleAsnValGluLeuArglleGlyGlyAlaAspLeu 358
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    IleThrTyrAspGluLeuAsnAsnLeuIleArgAsnGlyLysIleAspThrValValLeu 22
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                                                                              AlaCyBValAspMetGlnGlyArgLeuMetGlyLyBArgLeuThrGlyArgHisPheLeu
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                                                                                                                                                       ---GlyLeuAspGlnLysLyslleSerIleSerThrPheValTyrAlaValThrIleGlu
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Matches:
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 Sequence 1330, Application US/09252991A
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ORGANISM: Pseudomonas aeruginosa
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APPLICANT: MATC J. Rubenfield et al.

APPLICANT: MATC J. Rubenfield et al.

TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO PSEUDOMONAS TITLE OF INVENTION: AERGIGINOSA FOR DIAGNOSTICS AND THERAPEUTICS

TITLE OF INVENTION: AERGIGINOSA FOR DIAGNOSTICS AND THERAPEUTICS

CURRENT APPLICATION NUMBER: US/09/252,991A

CURRENT FILING DATE: 1999-02-18

PRIOR APPLICATION NUMBER: US 60/074,788

PRIOR APPLICATION NUMBER: US 60/094,190

PRIOR APPLICATION NUMBER: US 60/094,190

NUMBER OF SEQ ID NOS: 33142

SEQ ID NO 1330

LENGTH: 1350 :::::: ||| ||||||| || CIGCCGCCGCCCTTCTATGGCACGATGGCAC 225 170 nTrpMetAsnIleSerAlaSerSerGlyIleGluThrPheMetArgSerValArgAsnLy 190 113 ProLeuPheCysSerProArgValIleLeuMetGlnGlnIleGluArgLeuAlaAsnLeu 132 133 LysLeuLysGlyLeuPheAlaSerGluLeuGluPheAsnLeuPhe-----AsnGluThr 150 GGCTGGCAACCGGTGGTGGCCACCGAACTGGAGTTCTTCGTCTTCGCCCCGAACACCGAT 444 151. TyrLys-SerAlaSerGlnLysHisTrpLysAsnLeuLysThrAlaGlnProHisHisGl 170 230 683 504 GGCCTTCAGCGIGICTTCCAACAACGGCCIGCGGCGCTTCTTCGAGGACGTCTACCGCTG 563 59 79 CysHisLeuCysAlaAspLeuAsnSerLeuHisLeuLeuProTrpSerGluGlyAlaVal 99 LeuAlaCysVal-----AspMetGlnGlyArgLeuMetGlyLysArgLeuThrGlyArg HisPheLeuGlyLeuAspGlnLysLysIleSerIleSerThrPheValTyrAlaValThr 60 IleGluGlyileAlaGlyGlyGlyTyrGluIleSerSerValAspThrGlyTyrSerAsp -----aacacrcccccrrccccarcrcccargcargcargcarg 190 BLeuGluGluAlaGlyIleLeuMetGluAlaThrHisProGluPheLeuProSerGlnHi sGluLeuAsnPheValProAlaAspProLeuThrMetAlaAspArgHisIleIleAlaLy LeuAlaIleSerAsnProHisAsnPheValThrSerGlu-------1350 131 91 185 34 US-10-098-602A-2 (1-454) x US-09-252-991A-1330 (1-1350)

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APPLICANT: Marc J. Rubenfield et al.
APPLICANT: Marc J. Rubenfield et al.
TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO PSEUDOMONAS TITLE OF INVENTION: ABRUGINOSA FOR DIAGNOSTICS AND THERAPEUTICS
FILE REFERENCE: 107196.136
CURRENT APPLICATION NUMBER: US 60/074,788
PRIOR FILING DATE: 1999-02-18
PRIOR FILING DATE: 1999-02-18
PRIOR FILING DATE: 1999-07-27
NUMBER OF SEQ ID NOS: 33142
SEQ ID NO 1285
LENGTH: 2538
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                                                                              uSerSerThrAlaLeuGlyAsnAlaCysHisIleHisMetSerLeuGlnAspAlaGluTh
                                                                                                 GCTGGCGAAGACGCCGGGCAGCTCGATGCACACCAGAGCATCGTCGAACTGGACGG
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Patent No. 6551795
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Sequence 10926, Application US/09252991A
Patent No. 6551795
GENERAL INFORMATION:
APPLICANT: Marc J. Rubenfield et al.
TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO PSEUDOMONAS
                                                               2274 CCGTCCGGGCTGTCCACCCGCGGCCTGCTCAAGCAGGTGGTGGCGCCCTACGCCGCCCAC 2215
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TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO PSEUDOMONAS
TITLE OF INVENTION: AERUGINOSA FOR DIAGNOSTICS AND THERAPEUTICS
...----ATCCA 1089
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CURRENT APPLICATION NUMBER: US/09/252,991A

CURRENT FILING DATE: 1999-02-18

PRIOR APPLICATION NUMBER: US 60/074,788

PRIOR FILING DATE: 1998-02-18

PRIOR PILING DATE: 1998-07-27
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; Sequence 1279, Application US/09252991A
; Patent No. 6551795
; GENERAL INFORMATION:
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ORGANISM: Pseudomonas aeruginosa
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Best Local Similarity:
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APPLICANT: Marc J. Rubenfield et al.
TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO PSEUDOMONAS
TITLE OF INVENTION: ARENGINOSA FOR DIAGNOSTICS AND THERAPEUTICS
TITLE OF INVENTION: ARENGINOSA FOR DIAGNOSTICS AND THERAPEUTICS
TITLE OF INVENTION: ARENGINOSA FOR DIAGNOSTICS AND THERAPEUTICS
CURRENT FILING DATE: 107196.136
CURRENT FILING DATE: 1999-02-18
PRIOR PPLICATION NUMBER: US 60/074,788
PRIOR FILING DATE: 1998-02-18
PRIOR FILING DATE: 1998-07-27
SEQ ID NOS: 33142
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SEQ ID NOS: 33142
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                                                                                GlnAspAlaGluThrGluLysAsnAlaPheTyrAspGlnAsnAspGluTyrGlyMetSer 285
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       PheMetAlaLysLeuSerSerThrAlaLeuGlyAsnAlaCysHisIleHisMetSerLeu
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                131 AsnLeuLysteuLysGlyLeuPheAlaSerGluLeuGluPheAsnLeuPheAsn---Glu 149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  89 ATCGAACGCAACAGTCTGAACAAGTCTTCGAAAAAGGTATCAATCTCCCCGCTTCCCTG 148
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            36 LeuThrGlyArgHisPheLeuGlyLeuAspGlnLysLysIleSerIleSerThrPheVal 55
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ORGANISM: Pseudomonas aeruginosa
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                                                                               LeuThrGlyArgHisPheLeuGlyLeuAspGlnLysLysIleSerIleSerThrPheVal
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TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO PSEUDOMONAS TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO PSEUDOMONAS TITLE OF INVENTION: ARRUGINOSA FOR DIAGNOSTICS AND THERAPEUTICS CURRENT APPLICATION NUMBER: US/09/252,991A CURRENT FILING DATE: 1999-02-18 PRIOR APPLICATION NUMBER: US 60/074,788 PRIOR PILING DATE: 1998-02-18 PRIOR FILING DATE: 1998-02-18 PRIOR SEQUENCES INVERSE: US 60/094,190 PRIOR FILING DATE: 1998-07-27 NUMBER OF SEQ ID NOS: 33142 SEQ ID NOS: 33142
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                                            366 AlailelleAlaAlaGlyIleSerGlyIleGluGluLyBLeuGluLeuProProAla
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                                                                                                                                        386 SerGlyAsnValTyrAsnAspLysGluLeuProGluPheProAsnSerLeuGlnAsnAla
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Best Local Similarity:
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1009 CCGAGCTGGGGCCTGGACCGCACCGTGCCCTGCGCGCACCCGCAGCCCGGAAC 1068
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                  364 GGTGATCCCTTCTTCGCCGACCCCCGCGAAGTCCTGCGCCAGGTGGTGGCCAGGTTCACC 423
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SerGluProLeuPheCysSerProArgValIleLeuMetGlnGlnIleGluArgLeuAla 130
                                                                                                                  ThrTyrLysSerAlaSerGlnLysHisTrpLysAsnLeuLysThrAlaGlnProHisHis 169
                                                                                                                                                                          GlnTrpMetAsnIleSerAlaSerSerGlyIleGluThrPheMetArgSerValArgAsn 189
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                                                        131 AsnLeuLysLeuLysGlyLeuPheAlaSerGluLeuGluPheAsnLeuPheAsn---Glu
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Sequence 11417, Application US/09252991A

Patent No. 6551795
GENERAL INFORMATION:
TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO PSEUDOMONAS
TITLE OF INVENTION: AERGINOSA FOR DIAGNOSTICS AND THERAPEUTICS
FILE REPERENCE: 107196.136
CURRENT PILING DATE: 1999-02-18
PRIOR PPLICATION NUMBER: US 60/074,788
PRIOR FILING DATE: 1999-02-18
PRIOR FILING DATE: 1999-02-18
PRIOR FILING DATE: 1999-07-27
NUMBER OF SEQ ID NOS: 33142
SEQ ID NO 11417
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Matches:
Conservative:
Mismatches:
Indels:
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452.00
47.58%
28.18%
19.02%
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Best Local Similarity:
RESULT 9
US-09-252-991A-11417/c
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arity: 28.38\$ Mismatches: 18.94\$ Indels: 4 Gaps:	US-10-098-602A-2 (1-454) x US-09-252-991A-11262 (1-1470) Ov 1 MetThrlleThrTvrAspGluLeuAspAshLeulleArqAsnGlvLvsIleAspThrVal 20		Qy 21 ValLeuAlaCysValAspMetGlnGlyArgLeuMetGlyLysArgLeuThrGlyArgHis 40	Qy 41 PheLeuGlyLeuAspGlnLysLysIleSerIleSerThrPheValTyrAlaValThrIle 60	Qy 61 GluGly1leAlaGlyGlyTyrGluIleSerSerValAspThrGlyTyrSerAspCys 80 :::	Qy 81 HisteuCysAlaAspLeuAsnSerLeuHisLeuLeuProTrpSerGluGlyAlaVal 99 Bb 349 GTCTGCCGCCCGGACGAATGCCGTGTTCCTCGTCCCTGGGCCATCGAGCCCACCGCG 408	Qy 100 LeuAlaIleSerAsnProHisAsnPheValThrSerGluProLeuPheCysSerProArg 119 ::: :::		Qy 140 SerGluLeuGluPheAsnLeuPheAsnGluThr	Qy 151TyrLysSerAlaSerGlnLysHisTrpLysAsnLeuLysThrAlaGlnPrOHis 168	Oy 169 HisGlnTrpMetAsnIleSerAlaSerSerGlylleGluThrPheMetArgSerValArg 188	Qy 189 AsnLysLeuGluGlualaGlyIleLeuMetGlualaThrHisProGluPheLeuProSer 208	Qy 209 GlnHisGluLeuAsnPheValProAlaAspProLeuThrMetAlaAspArgHisIleIle 228	Qy 229 AlaLysHisGlyValArgGluMetAlaGluGlnSerGlyMetValAlaThrPheMetAla 248	249 LysLeuSerSerThrAlaLeuGlyAsnAlaCysHislleHisMetSerLeuGlnAspAla 26	Qy ;269 GluthrGluLysAsnAlaPheTyrAspGlnAsnAspGluTyrGlyMetSerThrLeuAla 288	Oy 289 ArgAsnTrplleAlaGlyLeuLeuLysTyrValProGluAlaThrTyrPhePheAlaSer 308	309 TyrileAsnSerTyrLysArgLeuGlnProLeuThrPheAlaProThrLysCysCysTrp
Db 873 GTCGCCGACCCGATGAAGGCCTGCGATGTATGCGGTGCTGAAGCGCCTGATCAAGAAC 814 Qy 236 MetAlaGluGlnSerGlyMetValAlaThrPheMetAlaLeuSerSerThrAlaLeu 255	Db 813 ATGGCCTAGGACGAGGATGGACACCTTCATGGCCAAGCCCTATCGGGGCCAGGCA 754	Oy 256 GlyAsnAlaCysHisIleHisMetSerLeuGlnAspAlaGluThrGluLysAsnAlaPhe 275	276 TyrAspGlnAsnAspGluTyrGlyMetSerThrLeuAlaArgAsnTrplleAlaGlyLeu	Oy 296 LeubysTyrValProGludlaThrTyrPhePheAlaSerTyrIleAsnSerTyrIvsArg 315 Oy 296 LeubysTyrValProGludlaThrTyrPhePheAlaSerTyrIleAsnSerTyrIvsArg 315 Oy 296 TentysCorrections	316 LeuGlnProLeuThrPheAlaProThrLysCysCysTrpAlaIleAspAsnArgThrSer 33 san mrcgrardcasarachcasarachcasarachcasarachcarachcasarach	336 AlaPheArgLeuCysAsnSerLysSerGluGly1leAsnValGluLeuArg1leGlyGly 35	AlaAspLeuAsnProTyrLeuAlaPheSerAlaileileAlaAlaGlyileSerGlyile 37	3luLeu SAG	Oy 396 ProGluPheProAsnSerLeuGlnAsnAlaThrHisLeuLeuLysGluSerLysMetLeu 415	416 AsntysThrPheGlyGluLysLeutleteuthisTyrValAsnAlaAsnValGlulle 43	436 AsnGluPheSerLysGlnValThrAspTrpGluLeuAsn 448 425 GAGAGTTCGAGAGAGTACTCGAGTACTCGAGTACAGAGTACTGAGTACTCGAGTACTCGAGTACTCGAGTACTGAGTACTGAGTACTGAGTACTGAGTACTGAGTACTGAGTACTGAGTACTGAGTACTGAGTACTGAGTACTAGAGTACTGAGTACTGAGTACTGAGTACTGAGTACTAGAGTACTGAGTACTGAGTACTGAGTACTAGAGTACTGAGTACTGAGTACTGAGTACTGAGTACTAGAGTACTGAGTACTGAGTACTAGAGTAGTAGTAGTAGTAGTAGTAGTAGTAGTAGTAGTA	SULT 10 09-252-991A-11262 Semience 11262 Anniicarion HS/0955991A	Rubenfield et al.	; TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO PSEUDOMONAS; TITLE OF INVENTION: AERUGINOSA FOR DIAGNOSTICS AND THERAPEUTICS; FILE REFERENCE: 107196.136. ; CURRENT APPLICATION NUMBER: US/09/252,991A	NT FILING DATE: 1999-(APPLICATION NUMBER: 1 FILING DATE: 1998-02 APPLICATION NUMBER: 1	; PRIOR FILING DATE: 1998-07-27 ; NUMBER OF SEQ ID NOS: 33142 ; SEQ ID NO 11262 ; LENGTH: 1470	; TYPE: DNA ; ORGANISM: Pseudomonas aeruginosa US-09-252-991A-11262	Alignment Scores: 6.86e-43 Length: 1470 Pred. No.: 6.86e-43 Matches: 130 Percent Similarity: 45.85% Conservative: 80

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1463
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                                                                                                   AlaileSerAsnProHisAsnPheValThrSerGluProLeuPheCysSerProArgVal 120
                                                                                                                                                                                                                        GluLeuGluPheAsnLeuPheAsnGluThrTyrLysSerAlaSerGlnLysHisTrpLys 160
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GTCCTCAAGAAAGTCCTCAAAACTCTATTCCGACAAGGGCTGGCAGCCGATCGTGGCGCG
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                  AlalleAspAsnArgThrSerAlaPheArgLeuCysAsnSerLysSerGluGlyIleAsn 348
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APPLICANT: Rhodes, Michael J.C.
APPLICANT: Rasson, Michael J.C.
APPLICANT: Rasson, Michael J.
APPLICANT: Gasson, Michael J.
TITLE OF INVENTION: PRODUCTION OF VANILLIN.
FILE REFRENCE: 2074/100
CURRENT APPLICATION NUMBER: US/09/155,183
CURRENT PILING DATE: 1999-05-03
EARLIER APPLICATION NUMBER: CPT/GB97/00809
SARLIER PILING DATE: 1996-03-24
EARLIER FILING DATE: 1996-03-24
SARLIER FILING DATE: 1996-03-24
SARLIER FILING DATE: 1996-03-3
SOFTWARE: Patentin Ver. 2.0
SEQ ID NO 12
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Patent No. 6323011
GENERAL INFORMATION:
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Best Local Similarity:
Query Match: .
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Pred. No.:
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....urress:
STREET: 941 Key West Avenue
CITY: Rockville
STATE: Maryland
COUNTRY: Inc.
ZIP.
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APPLICANT: Charles Kunsch
TITLE OF INVENTION: Strept
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CURRENT APPLICATION NUMBER: US/09/252,991A
CURRENT PILING DATE: 1999-02-18
PRIOR FILLING DATE: 1999-02-18
PRIOR FILLING DATE: 1998-07-18
PRIOR FILLING DATE: 1998-07-27
NUMBER: OF SEQ ID NOS: 33142
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                                                                                           AlaAsnValGluIleAsnGluPheSerLysGlnValThrAspTrpGlu
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Matches:
Conservative:
Mismatches:
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                                                                                                                                                                                                                      Sequence 10987, Application US/09252991A Patent No. 6551795
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US-09-252-991A-10987
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Sequence 1336, Application US/09134001C

Sequence 1336, Application US/09134001C

Patent No. 6380370

GENERAL INFORMATION:

APPLICANT: Lyan Doucette-Stamm et al

TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO STAPHYLOCOCCUS

TITLE OF INVENTION: EPIDERMIDIS FOR DIAGNOSTICS AND THERAPEUTICS

FILE REFERENCE: GTC-007

CURRENT APPLICATION NUMBER: US/09/134,001C

CURRENT FILING DATE: 1998-08-13

PRIOR APPLICATION NUMBER: US 60/064,964

PRIOR PLING DATE: 1997-11-08

PRIOR APPLICATION NUMBER: US 60/055,779
GACTTGGCACCTACTGCGGACAACACACGTGGTGAGATTGTGAATGTCTTGACC 10547
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9949 ATCATGACAGCAGGAAGGAAGGAAGGAAGCTGGTATACAGACCTTCCATCAACTCTTCAC 9890
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                                                                                                                                                                                                                                                                                                                                   253 ThralaLeuGlyAsnAlaCysHisIleHisMetSerLeuGlnAspAlaGluThrGluLys 272
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                                                                                                                                                           AsnPheValProAlaAspProLeuThrMetAlaAspArgHisIleIleAlaLysHisGly 232
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US-09-134-001C-1336
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| INDES ANTIGGAAGTETTGCAGGTETGTGTGTGTTGTATACAACAGAAGGTGAACCATTTGCG 10763
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  MEDIUM TYPE: Diskette, 3.50 inch, 1.4Mb storage COMPUTER: HP Vectra 486/33 OPERATING SYSTEM: MSDOS version 6.2 SOFTWARES ASCIT Text CURRENT APPLICATION DATA: APPLICATION NUMBER: US/08/961,527 FILING DATE: CLASSIFICATION NUMBER: US/08/961,527 FILING DATE: APPLICATION NUMBER: TLING DATE: APPLICATION NUMBER: ATORNEY/AGENT INFORMATION: NAME: Brookes, A. Anders REGISTRATION NUMBER: 98,373 REFERENCE/DOCKET NUMBER: 98,373 REFERENCE/DOCKET NUMBER: 98,340PL TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative:
Mismatches:
Indels:
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TELEFAX: (301) 309-8512
INFORMATION FOR SEQ ID NO: 151:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                 LENGTH: 13425 base pairs
TYPE: nucleic acid
STRANDEDNESS: double
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Matches:
                                            ; TYPE: DNA; CRANISM: Staphylococcus epidermidis US-09-134-001C-1336
PRIOR FILING DATE: 1997-08-14
NUMBER OF SEQ ID NOS: 5674
SEQ ID NO 1336
LENGTH: 1359
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APPLICANT: MARC J. Rubenfield et al.

APPLICANT: MARC J. Rubenfield et al.

TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO PSEUDOMONAS

TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES

TITLE OF INVENTION: AERUGINOSA FOR DIAGNOSTICS AND THERAPEUTICS

CURRENT PREDICATION NUMBER: US/09/252,991A

CURRENT FILING DATE: 1999-02-18

PRIOR FILING DATE: 1998-02-18

PRIOR FILING DATE: 1998-02-18

PRIOR APPLICATION NUMBER: US 60/094,190

PRIOR APPLICATION NUMBER: US 60/094,120

PRIOR APPLICATION NUMBER: US 60/094,120
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018 ATTGAAGTACGCTCAGTTGACCCTGCAGCTAACCCGTACATGGCATTAGCAGCAATTCTTA
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US-09-252-991A-11454
; Sequence 11454, Application US/09252991A
; Patent No. 655195
; GENERAL INFORMATION:
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and is derived by analysis of the total score distribution
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-MODEL=frame+ p2n.model.-DBV=xlh
-Q-Cgn2_1/USFTO spool/US10098602/runat_17122003_151235_28032/app_query.fasta_1.647
-Q=/Cgn2_1/USFTO spool/US10098602/runat_17122003_151235_28032/app_query.fasta_1.647
-Q=/Cgn2_1/USFTO spool/US10098602/runat_17122003_MINMATCH=0.1 -LOOPCL=0
-LOOPEXT=0 -UNITS=bits -STRAT=1 -END=-1 -MATRIX=blosum62 -TRANS=human40.cdi
-LIST=45 -DOCALIGN=200 -THR SCORES=ptc -THR MAX=100 -THR_MIN=0 -ALIGN=15
-MODE=LACAL -OUTFMT=ptc -NORM=ext -HRAPSIZE=500 -MINIEN=0 -MAXLEN=200000000
-USER=US10098602_@CGN 1_1 312_@runat_17122003_151235_28032 -NCPU=6 -ICPU=3
-NO WMAP -LARGEQUERY -NGG_SCORES=0 -MAIT -DSPEDCOK=100 -LONGLOG
-DEV TIMBOUT=120 -WARN TIMBOUT=30 -TRREADS=1 -XGAPOP=10 -KGAPEXT=0.5 -FCAPOP=6
-FGAPEXT=7 -YGAPOP=10 -YGAPEXT=0.5 -DELOP=6 -DELEXT=7
                                                                                                                                                                             December 17, 2003, 22:45:30 ; Search time 394 Seconds (without alignments) 3110.520 Million cell updates/sec
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Listing first 45 summaries
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3165847 TTCGGCGAGGATGTTGTCGCACTACCTGAACACGCGCGTGTGGAGCTGGCGGCGTTC 3165788
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AsnProTyrLeuAlaPheSerAlaIleIleAlaAlaGlyIleSerGlyIleGluGluLys 378
                            3166618 TATCGCGGGCTGACCCCGGCCAGCGACTACAACATCGACTACGCGATATTGGCATCCTCG
                                                                                                                                                                                                                                                                           3166498 GAGGCGGTCAAAGGCGAATGCAACATGGGCCAGCAGGAGATCGGGTTTCGTTACGAGAG
                                                                                                                                                                                                                                                                                                                                 ProleuThrMetAlaAspArgHisIleIleAlaLysHisGlyValArgGluMetAlaGlu
                                                                                                                                                                                                                                                                                                                                                          3166378 CAGCACGGCAAGAGCCTAACGTTCATGGCGAAATACGATGAACGCGGAA---GGTAATAGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ::: ||| ||| ::: ||| ||| 3166204 TIGCCGACCATTAACTCCTACAAGCGATTIGCCGAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3165907 CCGGTTACGCTGGCCGACGCTGTTCGAGGATTCTGCGCTGGTGCCGAGGCG
AlaSerGluLeuGluPheAsnLeuPheAsnGluThrTyrLysSerAlaSerGlnLysHis
                                                                                                                                                                 179 GlylleGluThrPheMetArgSerValArgAsnLysLeuGluGluAlaGlylleLeuMet
                                                                                                                                                                                                                                                                                                                                                                                                                     GlnSerGlyMetValAlaThrPheMetAlaLysLeuSerSerThrAlaLeuGlyAsnAla
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LeuGluLeuProProAlaSerGlyAsnValTyrAsnAspLysGluLeuProGluPhe
                                                                               TrpLysAsnLeuLysThrAlaGlnProHisHisGlnTrpMetAsnIleSerAlaSerSer
                                                                                                                                                                                                          3166558 ccentecheccerrectecherrecentrecentrecentrecentrecentre
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                                                                                             1172616 CTGCGCCGTCAGCTCGATCGG------CTCAAGGCGCGCGGACTGGTCGTG
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940 TATGACGATGCGCTCAAGGCAGCCGATGATGTTTTTGTTAAAAACGGCATCAAGGAA 999
236 MetalaGluGlnSerGlyMetValalaThrPheMetalaLygLeuSerSerThrAlaLeu 255
                                                                                                                                                                                                                                                                                              196 IleLeuMetGlualaThrHisProGluPheLeuProSerGlnHisGluLeuAsnPheVal
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                                                                                                                                                                                                                                                                                                                                                                                                                                                            124 GlnGlnileGluArgLeuAlaAsnieuLysLeuLysGlyLeuPheAlaSerGluLeuGlu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 176 AlaSerSerGlyIleGluThrPheMetArgSerValArgAenLysLeuGluGluAlaGly
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             829 AGTICTICGGACATC -----ATGGGTGAAGTICGCAAGTACATGCGTGATGCGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             216 ProAlaAspProLeuThrMetAlaAspArgHisileIleAlaLysHisGlyValArgGlu
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    This invention describes novel microorganisms (A), or their enzymatic extracts, able to convert isopropylamine (I) to L-alaninol (II) and which have the ipuH and ipuI genes, encoding enzymes involved in metabolism of (II), inactivated. (II) is an intermediate for pharmaceuticals, especially ofloxacin. Also the enzyme encoded by the bacterial ipuC gene (a gamma-glutamylamides ynthase) is used for synthesis of gamma- glutamylamides, specifically theanine. Inactivation of the ipuH and I genes improves production of (II). Typically, a Pseudomonas in which both culture. For a similar strain in which only the ipuI had been inactivated the maximum (II) concentration was about 7 mM, after 6 hour, falling to Pseudomonas putida KIE171-BII IpuC protein products (potential glutamine synthetase) which is described in the method of the invention.
                                                                                                                                                                                                                         L-alaninol; isopropylamine; iupI; ipuH; ofloxacin; ipuC; glutamylamide;
gamma-glutamylamide synthase; theanine; ds.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               New microorganism for converting isopropylamine to L-alaninol, useful as pharmaceutical intermediate especially ofloxacin, has the ipuH and genes for alaninol catabolism inactivated -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       De Azevedo Waesch SI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 1860 BP; 475 A; 428 C; 516 G; 441 T; 0 other;
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Matches:
Conservative:
Mismatches:
                                                                                                                                                                            Pseudomonas sp KIE171-BII ipuC encoding DNA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Claim 19; Page 91-93; 106pp; German.
                                                                                                                                                                                                                                                                                                                                           Location/Qualifiers
283..1662
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/product= "ipuC"
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                             AA168686 standard; DNA; 1860
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614.50
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Maire T;
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IID AA16

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215

828

784 CCGGTGGAAAAGAGCGGGCACTGCTACAGCATGCTCCATCAC--------TCT

PheAsnLeuPheAsnGluThrTyrLysSerAlaSerGlnLysHisTrpLysAsnLeuLys 163

123

104 AsnProHisAsnPheValThrSerGluProLeuPheCysSerProArgValIleLeuMet

193

84 AlaAspieuAsnSerieuHisieuLeuProTrpSerGluGlyAlaValLeuAlalleSer

64 AlaGlyGlyGlyTyrGluIleSerSerValAspThrGlyTyrSerAspCy8HisLeuCy8

LeuAspGlnLysLysIleSerIleSerThrPheValTyrAlaValThrIleGluGlyIle

44

:::::: 1174 AIGGITGCGCTTGCCCGAGAANGTCGCCCATCTATTTGCCGAATATCAACTCCTACAAG 1233 1234 cecacescresces recresces es esta en 1293 PheTyrAspGlnAsnAspGluTyrGlyMetSerThrLeuAlaArgAsnTrpIleAlaGly 294 315 ArgLeuGlnProLeuThrPheAlaProThrLysCysCysTrpAlaIleAspAsnArgThr 334 335 SerAlaPheArgLeuCysAsnSerLysSerGluGlyIleAsnValGluLeuArgIleGly 354 375 IleGluGluLysLeuGluLeuProProProAlaSerGlyAsnValTyrAsnAspLysGlu 394 295 LeuLeuLysTyrValProGluAlaThrTyrPhePheAlaSerTyrIleAsnSerTyrLys GlyAlaAspLeuAsnProTyrLeuAlaPheSerAlaIleIleAlaAlaGlyIleSerGly 355 275 셤 요 셤

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313 AAGGTCCGAGATTTTATTGAGAAACACAATATCGACACGATTAGGCTGGGTGCAGTCGAT 372

GluLeuAsnAsnLeulleArgAsnGlyLysileAspThrValValLeuAlaCysValAsp

US-10-098-602A-2 (1-454) x AAI68686 (1-1860)

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Indels: Gaps:

Percent Similarity: Best Local Similarity:

Query Match: DB:

MetGlnGlyArgLeuMetGlyLysArgLeuThrGlyArgHisPheLeu-----Gly

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3244 CCGGTGGAAAAGAGCGGGCACTGCTACAGCATGCTCCATCAC
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                         1468 TCGCCGGAGCTCGCTCGCCCACTCGCGCGTTGGAGGAGGCTGCCGGCATTTTCCGC 1527
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| 1528 GAAAGTGAATGGCGCGAGTGATCTTCCCTAACGAGTTCGTTGAGGACTATGCCCAGATG 1587
1414 ATCGAAAATAAACTCAAGCCGAAAGATCCAATCCTCGGTAACGCTTAC-----AAAGTA 1467
                                                430
                                                                                                                                                                                          L-alaninol; isopropylamine; iupI; ipuH; ofloxacin; ipuC; glutamylamide; gamma-glutamylamide synthase; theanine; ipuB; ipuB; ipuE; ipuF;
                 -----SerLeuGlnAsnAlaThrHisLeuLeuLys
                                               GluSerLysMetLeuAsnLysThrPheGlyGluLysLeuIleLeuHisTyrValAsnAla
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/note= "Unidentified partial ORF, no start or stop
                                                                                        De Azevedo Waesch SI;
                                                                              447
                                                                                                                                                                            C, D, E, F, G and H encoding DNA.
                                                                             431 AlaAsnValGluIleAsnGluPheSerLysGlnValThrAspTrpGluLeu
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                                                                                                                                                                                                                                          cocation/Qualifiers
                                                                                                                            standard; DNA; 11355 BP
                                                                                                                                                                                                                                                                                        "ipuB"
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                LeuProGluPheProAsn-
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                                                                                                                                                                            Pseudomonas putida ipuA, B,
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Maire T;
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This invention describes novel microorganisms (A), or their enzymatic extracts, able to convert isopropylamine (I) to L-alaninol (II) and which have the ipuH and ipuI genes, encoding enzymes involved in metabolism of (II), inactivated. (II) is an intermediate for pharmaceuticals, especially ofloxacin. Also the enzyme encoded by the bacterial ipuC gene (a gamma-glutamylamide synthase) is used for synthesis of gamma of utamylamides, specifically theanine. Inactivation of the ipuH and I genes improves production of (II). Typically, a Pseudomonas in which both ipuH and I genes were inactivated produced (II) at 8 mM after 60 hour culture. For a similar strain in which only the ipuI had been inactivated practically zero after about 20 hour. This sequence encodes the Pseudomonas putida IpuA, IpuB, IpuC, IpuD, IpuB, IpuE, IpuG and IpuH products which are described in the method of the invention.
                                                                                                                                                                                                              New microorganism for converting isopropylamine to L-alaninol, useful as pharmaceutical intermediate especially ofloxacin, has the ipuH and genes for alaninol catabolism inactivated
                                                  AAG80037, AAG80038, AAG80039, AAG80040, AAG80041,
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                                                                                                                                                                                                                                                                                                                                                                                                                             Claim 8; Fig 3A-N; 106pp; German
                                                       P-PSDB; AAG80036, AAG80037, A
AAG80042, AAG80043, AAG80044.
WPI; 2001-626266/72
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Alignment Scores:			
Pred. No.:	5.95e-55	Length:	11355
	614.50	Matches:	159
	50.77%	Conservative:	73
	34.79%	Mismatches:	194
	25.86%	Indels:	31
		Gaps:	10

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¥	7	GluLeuAsnAsnLeulleArgAsnGlyLys1leAspThrValValLeuAlaCysValAsp 26
، م	2773	2773 AAGGTCCGAGATTTATTATTGAGAACACAATATCGACACGATTAGGTTGGGTGCAGTCGAT 2832
Ł	27	27 MetGlnGlyArgLeuMetGlyLysArgLeuThrGlyArgHisPheLeuGly 43
ð	2833	ATAGATGGAGTCTGGCGCGGTAAGCAAGTTGGCGCAGAGTATTTCTTGAATAAGGCGGCT 2892
<u>~</u>	44	44 LeuaspGlnLysLyslleSerIleSerThrPheValTyrAlaValThrIleGluGlyIle 63
۵	2893	
	64	AlaGlyGlyGlyTyvGluIleSerSerValAspThrGlyTyrSerAspCysHisLeuCys 83
д	2953	2953GACGGTTTGGAGTTTACTGGCTGGGGTATCCGGGTATCCGGATATCGCCTTAATT 3006
≿ i	84	84 AlaAspLeuAsnSérLeuHisLeuLeuProTrpSerGluGlyAlaValLeuAlaIleSer 103
മ	3007	CCTGATCTTTCGACTCTTTCGCTGGTACCCTGGGAAAAACTGCTTCCGTCCTTTGC 3066
<u>×</u>	104	AsnProHisAsnPheValThrSerGluProLeuPheCysSerProArgValIleLeuMet 123
த	3067	3067 GATATCCAGCATCTAAATGGCGAGCCGCTGAATCTTTCGCCTAGGAACCTTCTGCGT 3123
<u>~</u>	124	GlnGlnijegluArgLeuAlaAsnLeuLysLeuLysGlyLeuPheAlaSerGluLeuGlu 143
م	3124	3124 AAAGCAATCGAAAAAAGCAGCAGCTAGGTTACAAGTGCTACGCTGCTTACGAGTTTGAG 3183
<u> 7</u> .	144	PheAsnLeuPheAsnGluThrTyrLysSerAlaSerGlnLysHisTrpLysAsnLeuLys 163
д	3184	3184 TITTACCTTCTTAACGACTCTATCGCGAGATCAGCGCAGATCAGTGGCGCAGCATTAAC 3243
ž	164	164 ThralaGlnPro
ą	3244	3244 CCGGTGGAAAAAGGCGGGCACTGCTACAGCATGCTCCATCACTCT 3288

for

polypeptides and nucleic acids useful for diagnosing infections, especially useful

Ä Bhatia

SS,

Mitcham JL, Wang S. Jen S, Carter D;

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Sequences AASS9506-AASS9804 represent DNA molecules encoding
Propionibacterium acnes immunogenic polypeptides. The proteins and their
Sasociated DNA sequences are used in the treatment, prevention and
diagnosis of medical conditions caused by P. acnes. The disorders include
SAPHO syndrome (synovitis, acne, pustulosis, hypertosis and
coteomycalitis), uvaitis and endophthalmitis. P. acnes is also involved
conditions of bone, joints and the central nervous system, however it
is particularly involved in the inflammatory lesions associated with acne
contacting the presence or absence of P. acnes in a
patient comprises contacting a sample with a binding agent that binds to
the proteins of the invention and determining the amount of bound protein
con the sample. The polypeptides may be used as antigens in the production
of antibodies specific for P. acnes proteins. These antibodies and
therefore treat P. acnes infections. The antibodies may also be used as
diagnostic agents for determining P. acnes presence, for example, by
caryme linked immunosorbent assay (ELISA). This sequence encodes the
proteins shown in AAUS4556-AAUS4928 and AAUG7560-AAUG7562.
Note: The sequence data for this patent did not form part of the printed
specification, but was obtained in electronic format directly from WIPO
at the. wipo.int/pub/published_pct_sequences.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence 34088 BP; 6991 A; 11002 C; 9453 G; 6639
                                                                                                                                                                                                                                                                                                                                                        Claim 1; SEQ ID No 61; 1069pp; English.
                                                                                                21-APR-2000; 2000US-199047P.
02-JUN-2000; 2000US-208841P.
07-JUL-2000; 2000US-216747P.
                                                                  20-APR-2001; 2001WO-US12865
                                                                                                                                                                                                    keiky YAW, Persing DH, M
'maisonneuve J, Zhang Y,
                                                                                                                                                                                                                                                                                                                      treating acne vulgaris -
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WO200181581-A2
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                     MetalaGluGlnSerGlyMetValAlaThrPheMetAlaLysLeuSerSerThrAlaLeu
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AlaSerSerGlyIleGluThrPheMetArgSerValArgAsnLysLeuGluGluAlaGly
                                                                  IleLeuMetGluAlaThrHisProGluPheLeuProSerGlnHisGluLeuAsnPheVal
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18847 ---CCGGCTGAAGTTGAGGGACCTTCGTTGAAGGCGTGGGCTTCGACGGCTCAGGCTATC 18791
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                                                                                                                                                       36 LeuThrGlyArgHisPheLeuGlyLeuAspGlnLysLysIleSerIleSerThrPheVal
                                                                                                           6 AspGluLeuAsnAsnLeuIleArgAsnGlyLysIleAspThrValValLeu-----
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187
51
        Length:
Matches:
Conservative:
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        4.43e-42
502.50
50.21%
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Best Local Similarity:
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SAPHO syndrome; synovitis; acne; pustulosis; hypertosis; osteomyelitis; uveitis; endophthalmitis; bone; joint; central nervous system; ELISA; inflammatory lesion; acne vulgaris; enzyme linked immunosorbent assay; dermatological; osteopathic; neuroprotectant; ds.

Propionibacterium acnes

Propionibacterium acnes immunogenic protein encoding DNA #61.

(first entry)

13-FEB-2002

T; 3 other;

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GlulleAsnGluPheSerLysGlnValThrAspTrpGluLeuAsnGln 449
                                                                                                                                                                                                                                                                                                      Location/Qualifiers
659..1999
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                                                                                                                                                                                                                                                                                                                                            "glnA2"
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                                                                                                                 BP.
                                                                                                                                                                                                                                                                                Brevibacterium lactofermentum.
                                                                                                                 ABQ82091 standard; DNA; 5500
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Kurahashi O;
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                                                                                                                           18673 AATCCTGACGGA-----ACCTCCTCTGCA-----GCTGATCCTCGTCACGTCCTCAGG 18626
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                                                                           18733 TTCCAAGTT¢T¢C¢AT¢¢¢CGTT¢T¢¢¢AC¢A¢¢¢¢¢¢¢G¢AGGAT¢TT¢T¢CAC¢ 18674
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                                                   LeuHisLeuLeuProTrpSerGluGlyAlaValLeuAla--------1leSer 103
                                                                                                                                                                                                                                                                                                      MetArgSerValArgAsnLysLeuGluGluAlaGlyIleLeuMetGluAlaThrHisPro 203
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  --SerAspCysHisLeuCysAlaAspLeuAsnSer 88
                                                                                                                                                                                                                                                                                                                                                                      GAGGCCGCTCCTGGACAGCACGAAATTGACCTTCGTTACGCCGATGCGCTGACGATGGCC
                                                                                                    AsnProHisAsnPheValThrSerGluProLeuPheCysSerProArgValIleLeuMet
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74 AspThrGlyTyr
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The present invention describes a coryneform bacterium (I) which has L-glutamine producing ability and has been modified so that its intracellular glutamine synthetase activity should be enhanced. Also described is a DNA. (II) coding for a profession and synthetase activity of glutamine synthetase adenylyl transferase activity (see ABLSSON and ABPRSSON respectively). (I) Is useful for producing complete L-glutamine in the medium and collecting the L-glutamine. Cacumulate L-glutamine in the medium and collecting the L-glutamine. L-glutamine produced by (I) is useful industrially as an ingredient of seasonings, as liver function promoting agents, in amino acid transfusions, and in comprehensive amino acid preparation. (II) is useful for breeding (I). The by-production of L-glutamine acid is useful for breeding (I). The production of L-glutamine is improved using (II). The present sequence encodes Brevibacterium lactofermentum glnAZ and glnE, which have glutamine synthetase activity and glutamine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Brevibacterium lactofermentum; glnA2; glnB; L-glutamine; fermentation; coryneform bacterium; glutamine synthetase adenylyl transferase; glutamine synthetase; liver function promoting agent; enzyme; seasoning;
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17689 GAATTTGAGGAGTACAACCGGCAGGTCAGCCAGTTCGAGCTTGATCGC 17642
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1520 GTGACCAACCAGTGGGTCAATTCCTACAAACGCATCGTGTACGGAAACGAAGCTCCAACT 1579
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Ikeda M, Ozaki A;
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07-APR-2000; 2000JP-0159162.
03-AUG-2000; 2000JP-0280988.
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1760 GACGAGCCAGCTGAGGACGATATCTCCCAACTTGAGCTTCCGGGAACGTCGCGCCATGGGC 1819 381 410 LysGluSerLysMetLeuAsnLysThrPheGlyGluLysLeulleLeuHisTyrValAsn 429 Novel polynucleotides derived from Coryneform bacteria, for identifying mutation point of a gene, measuring expression of a gene, analysing expression profile or pattern of a gene and identifying homologous gene TyrAsnAspLysGluLeuProGluPheProAsnSerLeuGlnAsnAlaThrHisLeuLeu AlaAlaAsnValGluIleAsnGluPheSerLysGlnValThrAspTrpGluLeuAsnGln SerLysSerGluGly1leAsnValGluLeuArg1leGlyGlyAlaAspLeuAsnProTyr LeualapheSeralallelleAlaAlaGlyIleSerGlyIleGluGluLysLeuGluLeu 382 ProProAlaSerGlyAsnVal------Ξ Yokoi Coryneform bacterium; amino acid synthesis; vitamin; saccharide; organic acid synthesis; ds. LysCysCysTrpAlalleAspAsnArgThrSerAlaPheArgLeuCysAsn---Claim 8; SEQ ID NO: 2442; 246pp + Sequence Listing; English. Ochiai K, glutamicum coding sequence fragment SEQ ID NO: 2442

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                   The present invention provides a number of nucleotide and protein as equences from the Coryneform bacterium Corynebacterium glutamicum. These are useful for identifying the mutation point of a gene derived from a mutant of coryneform bacterium, measuring expression amount and analysing the expression profile or expression pattern of a gene derived from Coryneform bacterium, and identifying a homologue of a gene derived from coryneform bacterium. Coryneform bacterium coryneform bacterium and identifying a homologue of a gene derived from coryneform bacterium. Coryneform bacterium coryneform bacterium in the organic acids, particularly L-lysine. The present sequence is a nucleic acid described in the exemplification of the invention.

Note: The sequence data for this patent did not form part of the printed specification, but was obtained in electronic format directly from the European Patent Office.
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                                       SerThrLeuAlaArgAsnTrpIleAlaGlyLeuLeuLysTyrValProGluAlaThrTyr
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528 AACATCATGACCTTCCGCTACATCATGAAACAGGTGGCAAGGGACCAAGGCGTCGGGGCA
                        Thr PheMet AlaLysLeu Ser Ser Thr AlaLeu Gly Asn AlaCysHis IleHis Met Ser
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111 SerGluProLeuPheCysSerProArgVallleLeuMetGlnGlnIleGluArgLeuAla 130
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                  pathway (MP) proteins given in AAB79634 to AAB80211. The C. glutamicum MP nucleic acids are useful for the production of fine chemicals in microorganisms, incoprational amino acids, portine and pyrimidine bases, nucleosides, nucleotides, lipids, saturated and unsaturated fatty acids, diols, carbohydrates, aromatic compounds, vitamins, cofactors, polyketides and enzymes.
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608 CGAAACGCGATGGTAGCGCTGGAGGAACTCGGCATCCCTGTCGAGTTCTCCCACCATGAA
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          AAF71753 to AAF72330 encode the Corynebacterium glutamicum metabolic
pathway (MP) proteins given in AAB79634 to AAB80211. The C. glutamic
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                                                                       LeuGlnAspAlaGluThrGluLysAsnAlaPheTyrAspGlnAsnAspGluTyrGlyMet
                           Tratrigagecearacc ---- AAcecerrccacearccagacearrcrracare
                                                       SerThrLeuAlaArgAsnTrpIleAlaGlyLeuLeuLysTyrValProGluAlaThrTyr
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Ikeda M, Ozaki A;
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ID AAH68531 standard; DNA; 349980 BP.
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07-APR-2000; 2000JP-0159162.
03-AUG-2000; 2000JP-0280988.
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                                                                                                                                                                                                        The present invention provides a number of nucleotide and protein sequences from the Coryneform bacterium Corynebacterium glutamicum. These are useful for identifying the mutation point of a gene derived from a mutant of coryneform bacterium, measuring expression amount and analysing the expression profile or expression pattern of a gene derived from coryneform bacterium, and identifying a homologue of a gene derived from coryneform bacterium, Coryneform bacterium, Coryneform bacterium, Coryneform bacterium, and identifying a homologue of a gene derived from coryneform bacterium, Coryneform bacterium acids, nucleic acids, vitamins, saccharides and organic acids, in the exemplification of the invention.

Note: The sequence data for this patent did not form part of the printed specification, but was obtained in electronic format directly from the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           185 ArgSerValArgAsnLysLeuGluGluAlaGlyIleLeuMetGluAlaThrHisProGlu 204
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                                                                                 mutation point of a gene, measuring expression of a gene, analysing expression profile or pattern of a gene and identifying homologous gene
                                                           for identifying
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----CAAAGCCTTCGCACCAACGGACTGCCACCTGTG
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                                                                                                                                                                      Disclosure; SEQ ID NO: 7066; 246pp + Sequence Listing; English.
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                                                             Novel polynucleotides derived from Coryneform bacteria,
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                                                                                                                                                                                                                                                                                                       The present invention is related to a Lactococcus lactis nucleotide sequence (AAB90521) and related proteins (ABB5300-ABB5561). The nucleic acid sequence is useful in the detection and/or amplification of nucleic acid sequence, particularly to identify Lactococcus lactis or related species. The proteins of the invention are useful for the biosynthesis or biodegradation of a composition of interest. The production helps research in lactic bacteria, particularly useful in the production of yogurt and cheese.

Note: The sequence data for this patent is based on equivalent patent WO200177334 (published 18-07-2001) which is available in electronic format directly from WIPO at ftp.wipo.int/pub/published_pct_sequences.
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                                                                                                                                                                                                                           New nucleotide sequence useful in the identification or lactis and related species \mbox{-}
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Best Local Similarity;
Query Match:
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                                                  PheleuProSerGlnHisGluLeuAsnPheValProAlaAspProLeuThrMetAlaAsp
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Bifidobacterium longum NCC2705 related nucleotide sequence SEQ ID:1104

Bifidobacterium longum NCC2705; Bifidobacterium; bacterial; antidiarrheic; antibacterial; inhibitor of Salmonella; detection; identification; lactic acid bacterium; diarrhoea; pathogenic bacteria; rotavirus; food composition; pharmaccutical composition; gene; ds.

Bifidobacterium longum.

Synthetic.

EP1227152-A1

31-JUL-2002

30-JAN-2001; 2001EP-0102050.

2001EP-0102050

30-JAN-2001;

(NEST) SOC PROD NESTLE

WPI; 2002-668397/72.

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2283184 GGTTATTTTGACCTTGCACCAACTGACCTCGCTGGAAACACACAGAGGCGTGAAATCGTAAAT 2283125
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                                                                                         170 GlnTrpMetAsnIleSerAlaSerSerGlyIleGluThrPheMetArgSerValArgAsn
                                                                                                                                                                                                                                                                              LysHisGlyValArgGluMetAlaGluGlnSerGlyMetValAlaThrPheMetAlaLys
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The present invention describes a polynucleotide a gequence of a Bifidobacterium genome selected from the nucleotide acquence given in ABQ81842 and ABQ81843, or a sequence exhibiting at least 90% identity or which hybridises with the sequence exhibiting at least 90% identity or which hybridises with the sequence exhibiting at least 90% identity or which hybridises with the sequence exhibiting at least protein, comprising a sequence selected from 1097 sequences given in ABB6528 to AB66534 ligated in frame to a polynucleotide [II] encoding a heterologous polypeptide. (I) has antidiarrheic, and can be used as an inhibitor of Salmonella. (I) which is a probe) is useful for the detection and/or identification of Bifidobacterium Bifidobacterium longum in a biological sample. A carrier containing the lactic acid bacteria and/or rotavirus. The carrier is a food composition selected from milk, yogurt, cutd, cheese, fermented milks, milk based fermented products, ice-creams, fermented cereal based products, milk based fermented products, ice-creams, fermented cereal based products, milk based ferm tablets, lifatid bacterial auspensions, dried oral supplement, wet oral supplement, dry tube feeding or wet tube feeding.

(I) is useful in DNA arrays or chips to carry out analysis of the Bifidobacterium related nucleotide sequences given in the Sequence better invention but not mentioned further within the lates.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         --ThrGlyTyrSerAspCys 80
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             The present invention describes a polynucleotide (I) comprising
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Matches:
Conservative:
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Indels:
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Best Local Similarity:
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BP.

DNA; 349980

standard;

ABQ81848 ABQ81848; (first entry)

19-NOV-2002

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MetThrIleThrTyrAspGluLeuAsnAsnLeuIleArgAsnGlyLysIleAspThrVal 20
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The method comprises exposing trans-ferulic acid, or its salts, to trans-ferulate:CASH ligase, trans-feruloy1 SCOA hydratase and 4-hydroxy-3-methoxypheny1-beta-hydroxypropiony1-S-COA cleavage activities. A similar novel method in which vanillin is converted to vanillic acid, or its salts, utilises a 4th enzyme, especially vanillin dehydrogenase vanillin is a well known food flavouring, and vanillic acid can be used to make oligomers, or as a monomer for production of polyseters. By expressing vanillin in plants or food-grade microorganisms, vanillin is generated in situ during preparation of fermented foods and beverages. Transgenic plants, particularly food plants, may be able to produce other particularly food plants, may be able to produce other compounds in addition to vanillin. This method is less expensive than extraction from Vanilla pods, and generates a challar product as only enzymes are used. The product is very similar to natural Vanilla pod extract.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          of vanillin from trans-ferulic acid using 3 enzymes - followed by oxidation to vanillic acid, useful as a food
                                                                                                                                                                                                                                                                       product/pF1901; vanillin product
production; food flavouring; ss.
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Indels:
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                                                                106689 CAGGTCACGCCTTACGAGCTGAAGAAG 106715
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Matches:
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                                               GlnValThrAspTrpGluLeuAsnGln
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Rhodes MJC,
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                                                                                                                                             ВР
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46.05%
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                                                                                                                                                                                                                                                                       Merged contigs; pF1913/PCR vanilla pod; vanillic acid
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                                                                                                                                                                                                                                                                                                                      Pseudomonas fluorescens.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Narbad A,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             105657 ACCGCCCGCATGTTCTGCGACATTCTGACCCCG------GACGGCGAGACCTTCG 105704
                                                                                                                                                            CTCGGCGATCCACGTCACGTGTTGAAGCGC-----ACGCTCGCCAAAGCCAAGGAC 105755
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                                                                                                                                                                                                                                                                                       -----AGCCAGGACGACTGGTCCAAGGCCCCGACCCCGATCGACGAGGGCGGCTAC 105857
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                                                                                                                            PheCysSerProArgVallleLeuMetGlnGlnIleGluArgLeuAlaAsnLeuLysLeu
                                                                                                                                                                                           LysGlyLeu-----PheAlaSerGluLeuGluPheAsnLeuPheAsnGluThrTyr
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GACTATGTCGAAGACGACATCTAT---TACGAACTGCTCGACCGGCCGACATCGACATG
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The invention relates to a protein (ABP25413-ABP30895) from group B streptococcus/GBS (Streptococcus agalactiae) or group A streptococcus/GAS (Streptococcus agalactiae) or group A streptococcus/GAS (Streptococcus pyogenes), comprising one of 5481 sequences (S1), given in the specification. The proteins have antibacterial and antiinflammatory activity. (I), nucleic acids encoding (I), ABN66044-ABN1526 and antibodies that bind (I) are used in the manufacture of medicaments for the treatment or prevention of infection or disease caused by Streptococcus bacteria, particularly S. agalactiae and S. pyrogenes. (Nucleic acids encoding (I) are used to detert Streptococcus in a biological sample. (I) is used to determine whether a compound binds to (I). A composition comprising (I) or a nucleic acid encoding (I), may be streptococcus that is prevented or treated may be meningitis. Nucleic acid encoding (I) may be used to recombinantly produce (I) and may be
                                                                                                                                                                                                                                                                                                                                                                                                                            1583
1464 AACCGCCTGCCGGGTGCCGACGCCAACCCGTACCTGGCGATTGCCGCGAGCCTGCTGTGC 1523
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                                                                                                                    GlylleSerGlylleGluGluLysLeuGluLeuProProProAlaSerGlyAsnValTyr
                                                                                                                                                                                                                      391 AsnAspLysGluLeuProGluPheProAsnSerLeuGlnAsnAlaThrHisLeuLeuLys
                                                                                                                                                                                                                                                                                                1584 GAGCGCGCAACCTG---CGTCTGCCGCTGACCATCGAAGACGCTCTGGAACGCATGGAA
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or disease caused by Streptococcus bacteria, such as meningitis,
for detecting a compound that binds to the protein -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ΰ
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24-NOV-2000; 2000GB-0028727.
07-MAR-2001; 2001GB-0005640.
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                                                                                                       TyrPhePheAlaSerTyrIleAsnSerTyrLysArgLeuGlnProLeuThrPheAlaPro 323
                                                                                                                                                               ThrLysCysCysTrpAlalleAspAsnArgThrSerAlaPheArgLeuCysAsnSerLys 343
                                                                                                                                                                               GTTTACGTTGGCAGGTCGCAATCGTTCGCCACTTATTCGTGTACCTGCATCTCGA 990
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       GCTATCATTAATCCAACTGTTAATTCTTATAAACGTTTGGTACCAGGATACGAAGCACCA
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                                               ---SerThrLeuAlaArgAsnTrpIleAlaGlyLeuLeuLysTyrValProGluAlaThr
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Tettelin H;
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TCTGATATGTATTTATATCCTGATTTAGATACTTGGATTGTCTTTCCTTGGGGAGATGAA 258
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                                                                                                                                                                                                                                     MetThrileThrTyrAspGluLeuAsnAsnLeuIleArgAsnGlyLysIleAspThrVal 20
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chromatography, immunoassays, and distinguishing/identifying Streptococcus proteins.
                                                               277 G; 417 T; 0 other
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Matches:
Conservative:
Mismatches:
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445.00
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-----GCTACAGATGAACAATTAGACAAGTTTTATCAAATAAAGCAATGTTTGATGGA 1725892
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                                                                                                              etreptococcus/GBS (Streptococcus againstine) or group A strengtococcus/GAS (Streptococcus againstine) or group A strengtococcus (Streptococcus pyogenes), comprising one of 5483 sequences (S1), given in the specification. The proteins have antibacterial and antiinflammatory activity. (I), nucleic acids encoding (I), ABNS6644-ABN71526 and antibodies that bind (I) are used in the manufacture of medicaments for the treatment or prevention of infection or disease caused by Streptococcus bacteria, particularly S. agalactiae and S. pyrogenes. Nucleic acids encoding (I) are used to detect Streptococcus in a biological sample. (I) is used to determine whether a compound binds to (I). A composition comprising (I) or a nucleic acid encoding (I), may be used as a vaccine or diagnostic composition. The disease caused by Streptococcus that is prevented or treated may be meningitis. Nucleic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ---GlyAlaValLeuAlaIleSerAsnProHisAsnPheValThrSerGluProLeuPhe 115
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ValleuAlaCysValAspMetGlnGlyArgLeuMetGlyLysArgLeuThrGlyArgHis 40
Streptococcus protein for the treatment or prevention of infection lisease caused by Streptococcus bacteria, such as meningitis, and detecting a compound that binds to the protein -
                                                                                                                                                                                                                                                                                                                      acid encoding (I) may be used to recombinantly produce (I) and may be used in gene therapy. Antibodies to (I) are used for affinity chromatography, immunoassays, and distinguishing/identifying
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                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 2155561 BP; 695741 A; 385320 C; 382958 G; 691542 T; 0 other;
                                                                                                    relates to a protein (ABP25413-ABP30895) from group B
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1725126 GTTTACGTTGCTTGGGTCGCAATCGTTCGCCACTTATTCGTGTACCTGCATCTCGA 1725067 1725544 1725543 GAAATTGTTAATGTCTTAACACAAATGGGCTTTGAAGTTGAAGCTAGTCATCATGAAGTA 1725484 1725187 1725186 GCTATCATTAATCCAACTGTTAATTCTTATAAACGTTTGGTACCAGGATACGAAGCACCA 1725127 1725007 1724887 1724826 GCGGCCCTAGGAACTCATATCTATACTAATTTCTTAGACGCTAAGCGTATTGAATGGGCA 1724767 284 303 363 417 LysThrPheGlyGluLysLeuIleLeuHisTyrValAsnAlaAlaAsnValGluIleAsn 436 Streptococcus, GAS, GBS, group B streptococcus, Streptococcus agalactiae, group A streptococcus, Streptococcus pyogenes, antibacterial, gene, antiinflammatory, infection, vaccine, meningitis; gene therapy, ds. SerValArgAsnLysLeuGluGluAlaGlyIleLeuMetGluAlaThrHisProGluPhe · 206 LeuProSerGlnHisGluLeuAsnPheValProAlaAspProLeuThrMetAlaAspArg 1725483 GCAGTTGGACAGCATGAATTGACTTTAAATATGATGATGTTTTTAAAAGCCTGTGACAAC 226 HisIleIleAlaLysHisGlyValArgGluMetAlaGluGlnSerGlyMetValAlaThr PheMetAlaLysLeuSerSerThrAlaLeuGlyAsnAlaCysHisIleHisMetSerLeu 266. GlnAspAlaGluThrGluLysAsnAlaPheTyrAspGlnAsnAspGluTyrGlyMet---285 ---SerThrLeuAlaArgAsnTrplleAlaGlyLeuLeuLysTyrValProGluAlaThr 1725246 TTATCAGAGGATGCCTACTACTTTTAGGTGGGTTAATGAAACACGCTTACAATTACAA 304 TyrPhePheAlaSerTyrIJeAsnSerTyrLysArgLeuGlnProLeuThrPheAlaPro ThrLysCysCysTrpAlalleAspAsnArgThrSerAlaPheArgLeuCysAsnSerLys 1725066 GGTATGGGAACACGCCTAGAATTGCGCTCGGTTGACCCAACAGCAAATCCTTATCTTGCT 364 PheSerAlaIleIleAlaAlaGlyIleSerGlyIleGluGluLyBLeuGluLeuProPro -- AsnAspLysGluLeuPro CCAATTGAGACAATATCTATGCTATGACTGTAGAAGAACGTCGAAGCAGGTATTGTT GluPheProAsnSerLeuGlnAsnAlaThrHisLeuLeuLysGluSerLysMetLeuAsn SerGluGlyIleAsnValGluLeuArgIleGlyGlyAlaAspLeuAsnProTyrLeuAla GluPheSerLysGlnValThrAspTrpGluLeuAsnGlnGlyPheAsnArgTyr polynucleotide SEQ ID NO 4901 ВР ProAlaSerGlyAsnValTyr-ABN68494 standard; DNA; 1344 (first entry)

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949 GGAAGTAATCGTTCACCGTTATCCGTGTTCCAGCATCACGTGGTATGGGAACGCGTTTG 1008
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         the invention relates to a protein (ABP25413-ABP30895) from group B streptococcus/GBS (Streptococcus agalactiae) or group A streptococcus/GBS (Streptococcus agalactiae) or group A streptococcus/GBS (Streptococcus pyogenes), comprising one of 5481 sequences (S1), given in the specification. The proteins have antibacterial and antiinflammatory activity. [1], nucleic acids encoding (1), ABN66044-ABN1526 and mantibodies that bind (1) are used in the manufacture of medicaments for the treatment or prevention of infection or disease caused by Streptococcus bacteria, particularly S. agalactiae and S. pyrogenes. [1] Nucleic acids encoding (1) are used to detecr Streptococcus in a biological sample. (1) is used to determine whether a compound binds to (1). A composition comprising (1) or a nucleic acid encoding (1), may be used to recombinantly produce (1) and may be caid encoding (1) may be used to recombinantly produce (1) and may be chemically immunoassays, and distinguishing/identifying Streptococcus proteins.
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24-NOV-2000; 2000GB-0028727.
07-MAR-2001; 2001GB-0005640.
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Sequence 1, Appli Sequence 750, App Sequence 152, App Sequence 151, App Sequence 311, App Sequence 210, Appl Sequence 112, App Sequence 112, App Sequence 112, App Sequence 112, App Sequence 12996, A Sequence 12996, A Sequence 28, Appl Sequence 28, Appl Sequence 22, Appl Sequence 23, Appl Sequence 24, Appl Sequence 23, Appl Sequence 23, Appl Sequence 23, Appl Sequence 24, Appl Sequence 23, Appl

Scoring table:

Searched:

Minimum DB Maximum DB

Database

Perfect score:

Sequence:

OM protein

Run on:

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DB 15; Length 454;
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           US-10-299-799-1

US-09-815-242-10418

US-10-156-721-750

US-10-205-823-152

US-10-094-749-3166

US-09-115-242-5216

US-09-115-116-241

US-09-771-161A-241

                                                                                                                                                                                                                  US-09-214-592-28

US-09-214-592-28

US-09-815-242-12610

US-09-815-242-12610

US-09-944-987B-175

US-10-272-502A-22

US-10-144-194A-22

US-10-144-194A-22

US-10-144-194A-22

US-10-145-22

US-10-29-12-24

US-09-815-242-11466

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US-09-815-242-11466
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US-09-738-626-5785
US-09-895-913A-246
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APPLICANT: IKEDA, HARUO
APPLICANT: ISHIKAWA, JUN
APPLICANT: ISHIKAWA, JUN
APPLICANT: SHIBA, TADAYOSHI
APPLICANT: SHIBA, TADAYOSHI
APPLICANT: SAKKI, YOSHIYKI
APPLICANT: BATTORI, WASHIKR
APPLICANT: HATTORI, WASHIKR
CURRENT FILING: 249-262
CURRENT APPLICATION NUMBER: US/10/156,761
CURRENT APPLICATION NUMBER: US 2001-204089
PRIOR FILING DATE: 2001-05-30
PRIOR FILING DATE: 2001-05-30
PRIOR FILING DATE: 2001-05-30
PRIOR FILING DATE: 2001-05-30
PRIOR FILING DATE: 2001-05-30
PRIOR FILING DATE: 2010-05-30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ALIGNMENTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 14253, Application US/10156761
Publication No. US20030119018A1
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    , ORGANISM: Streptomyces avermitilis US-10-156-761-14253
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Best Local Similarity 38.7
Matches 175; Conservative
93.5
92.9
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ORGANISM:
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Sequence 2, Appli
Sequence 1342, Ap
Sequence 1378, A
Sequence 1331, Ap
Sequence 12338, A
Sequence 12775, A
Sequence 12775, A
Sequence 1614, A
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Sequence 11137, A
Sequence 57, Appl
Sequence 12088, A
Sequence 11507, A
                                                                                                     December 17, 2003, 22:44:55; Search time 31 Seconds (without alignments) 2735.110 Million cell updates/sec
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2376
1 MTITYDELNNLIRNGKIDTV......INBFSKQVTDWBLNQGFNRY
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| Cgn2_6/ptodata1/pubpaa/US07_PUBCOMB.pep:*
| Cgn2_6/ptodata1/pubpaa/US07_NEW_PUB.pep:*
| Cgn2_6/ptodata1/pubpaa/US06_PUBCOMB.pep:*
| Cgn2_6/ptodata1/pubpaa/US07_NEW_PUB.pep:*
| Cgn2_6/ptodata1/pubpaa/US07_NEW_PUB.pep:*
| Cgn2_6/ptodata1/pubpaa/US08_PUBCOMB.pep:*
| Cgn2_6/ptodata1/pubpaa/US08_PUBCOMB.pep:*
| Cgn2_6/ptodata1/pubpaa/US08_PUBCOMB.pep:*
| Cgn2_6/ptodata1/pubpaa/US08_PUBCOMB.pep:*
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| Cgn2_6/ptodata1/pubpaa/US09_PUBCOMB.pep:*
| Cgn2_6/ptodata1/pubpaa/US10B_PUBCOMB.pep:*
             version 5.1.6
- 2003 Compugen Ltd.
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5 US-10-062-458-2

US-09-015-262-5942

US-09-015-242-13378

US-09-015-242-1338

US-09-015-242-12338

US-09-015-242-12338

US-09-015-242-12775

US-09-015-242-12775

US-09-015-242-11332

US-09-015-242-11332

US-09-015-242-11332

US-09-015-242-11332

US-09-015-242-11332

US-09-015-242-11367
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Maximum Match 100%
Listing first 45 summaries
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             GenCore (c) 1993
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seq length: 200000000
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Match Length
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13; Gaps

121

68 MNTVDGYDMSSWDRGYGDFAMHPDLSTLRQVPWNAGTALLIAD-LAWNDGSPVVAAPRQI 62 GIAGGGYEISSVDTGYSDCHLCADLNSLHLLPWSEGAVLAISNPHNFVTSEPLFCSPRVI

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                                                                                                                          347
                                                                                                                                                                     ---YNDKELPEFPNSLQNATHLL 409
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              131 NLKLKGLFASELEFNLFNETYKSASOKHWKNLKT-----AQPHHQWMNISASSGIETFM 184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      245 TFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLARNWIAGLLKYVPEATY 304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLARNWIAGLLKYVPEATY
                        305 FFASYINSYKRLQPLTFAPTKCCWAIDNRTSAFRLCN---SKSEGINVELRIGGADLNPY
                                                                                                             288 VINGWYNSYKRIVYGNEAPTAATWGVSNRSALVRVPTYRLNKEESRRVEVRLPDTACNPY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  29 GHLKSVVVVAPAELESAL------EEGIGFD------GSAIEGYA----RISEAD
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               84; Mismatches 174; Indels
                                                                                                                                                                                                                                                          410 KESKMLNKTFGEKLILHYVNAANVEINEFSKQVTDWELNQGFN 452
                                                                                                                                                                                                                                                                                       ::|::| | | : : : | | : : ESSELVADILGEHVFEFFLRNKWREWRDYQEQITPWELRNNLD 445
                                                                                                                                                                         LAFSAIIAAGISGIEEKLELPPPASGNV----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT: OZAKI, AKIO
TITLE OF INVENTION: NOVEL POLYNUCLEOTIDES
FILE REFERENCE: 249-125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CURRENT APPLICATION NUMBER: US/09/738,626
CURRENT FILING DATE: 2000-12-18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRIOR APPLICATION NUMBER: JP 99/377484
PRIOR FILING DATE: 1999-12-16
PRIOR PELING DATE: 1999-12-16
PRIOR PLILING DATE: 2000-04-07
PRIOR PLILING DATE: 2000-08-03
PRIOR RILING DATE: 2000-08-03
NUMBER OF SEQ ID NOS: 7059
SOFTWARE: PACENTIN VET: 3.0
                                                                                                                                                                                                                                                                                                                                                                                                           ; Sequence 5942, Application US/09738626; Publication No. US20020197605A1; GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Corynebacterium glutamicum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MIZOGUCHI, HIROSHI
ANDO, SEIKO
HAYASHI, MKIRO
OCHIAI, KEIKO
YOKOI, HARUHIKO
TATEISHI, NAOKO
SENOH, AKIHIRO
IKEDA, MASATO
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Best Local Similarity
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US-09-738-626-5942
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APPLICANT:
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APPLICANT: NAKAMURA, JUN
APPLICANT: NAKAMURA, JUN
APPLICANT: NAKAMURA, JUN
APPLICANT: KAWASHIMA, HIROKI
APPLICANT: NAKAMATSU, TSUYOSHI
APPLICANT: NAKAMATSU, TSUYOSHI
TITLE OF INVENTION: PRODUCING L-GLUTAMINE BY FERMENTATION AND L-GLUTAMINE
FILE REFERENCE: 219181US0
CURRENT APPLICATION NUMBER: US/10/062,458
CURRENT APPLICATION NUMBER: JP 2001-28163
PRIOR PILING DATE: 2001-02-05
PRIOR FILING DATE: 2001-02-05
PRIOR FILING DATE: 2001-05-30
NUMBER: OF SEQ ID NOS: 25
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                                                                                                                                                                                               242 MVATFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLARNWIAGLLKYVPE 301
                                                                                                                                                                                                                                                                                                                                                                       LAFSAIIAAGISGIEEKLELPPPASGNVYNDKELPEFPNSLQNATHLLKESKMLNKTFGE 421
                          LMQQ1ERLANLKLKGLFASELEFNLFNETYKSASQKHWKNLKTAQPHHQWMNISASSGIE 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  99
                                              302 ATYFFASYINSYKRLOPLTFAPTKCCWAIDNRTSAFRLCNSKSEGINVELRIGGADLNPY
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                                                                                                           182 TFMRSVRNKLEEAGILMEATHPEFLPSQHELNFVPADPLTMADRHIIAKHGVREMAEQSG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                          KLILHYVNAANVEINEFSKOVTDWELNQGFNR 453
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Publication No. US20030003550A1
GENERAL INFORMATION:
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Best Local Similarity
Matches 135; Conserv
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61 EGIAGGGYEISSVDTGY-SDCHLCADLNSLHLLPWSEGA-----VLAISNPHNFVTSEP 113
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STLARNWIAGLLKYVPEATYFFASYINSYKRLQPLT-----FAPTKCCWAIDNRTSA 336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      337 FRL---CNSKSEGINVELRIGGADLNPYLAFSAIIAAGISGIEEKLELPPPASGNVY--N 391
                                                                                                                                                                                                                                                              LRIGGADLNPYLAFSAIIAAGISGIEEKLELPPPASGNVY-----NDKELPEFPNSLQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ---HHOWMNISASSGIETFWRSVRNKLEEAGILMEATHPEFLPSOHELNFVPADPLTMAD
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                                                            219 VKTIARKHGLYATFMAKPKFGIAGSGMHCNMSLFDAE-GNNAFFDPNDPKGMQLSETAYH
                                                                                                                                291 WIAGLLKYVPEATYFFASYINSYKRLQPLTFAPTKCCWAIDNRTSAFRLCNSKSEGINVE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 114 LFCSPRVILMQQIERLANLKLKGLFASELEFNLFNETYKSASQKHWKNLKTAQP----
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Pred. No. 1.3e-35;
74; Mismatches 167; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT: SHIBA, TADAYCSHI
APPLICANT: SAKKI, YOSHIYUKI
APPLICANT: SAKKI, YOSHIYUKI
APPLICANT: HATTORI, MASAHIRA
TITLE OF INVENTION: NOVEL POLYNUCLEOTIDES
FILE REFERENCE: 249-262
CURRENT APPLICATION NUMBER: US/10/156,761
CURRENT APPLICATION NUMBER: JP 2001-204089
PRIOR FILING DATE: 2001-05-30
PRIOR FILING DATE: 2001-05-30
PRIOR FILING DATE: 2001-06-30
FRIOR FILING DATE: 2001-06-30
SRIOR APPLICATION NUMBER: JP 2001-272697
NUMBER OF SEQ ID NOS: 15109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         5-10-156-761-13481
Sequence 13481, Application US/10156761
Publication No. US20030119018A1
GENERAL INPORMATION:
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; ORGANISM: Streptomyces avermitilis
US-10-156-761-13481
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30.0%;
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APPLICANT: IKEDA, HARUO
APPLICANT: ISHIKAWA, JUN
APPLICANT: HORIKAWA, HIROSHI
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Best Local Similarity 30.09
Matches 127; Conservative
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                                                                                                                             LAFSAIIAAGISGIEEKLELPPPASGNV-----YNDKELPEFPNSLQNATHLL 409
                                                                                                                                                                  ||||| :: ||: ||: ||: || :: ||: || :: ||: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: || :: |
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      107 GDPRGNLKRALRHMEEVGFKSFNLGPEPEFFLFKLDENGDPTLEVNDKG------GYF 158
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        116 CSPRVILMQQIERLANLKLKGL-FASELEFNLF--NETYKSASQKHWKNLKTAQPHHQWM 172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NISASSGIETFMRSVRNKLEEAGILMEATHPEFLPSQHELNFVPADPLTMADRHIIAKHG 232
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                                                            288 VTNOWVNSYKRIVYGNEAPTAATWGVSNRSALVRVPTYRLNKEESRRVEVRLPDTACNPY
FFASYINSYKRLOPLTFAPTKCCWAIDNRTSAFRLCN---SKSEGINVELRIGGADLNPY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1 MTITYDELNNLIRNGKIDTVVLACVDMQGRLMGKRLTGRHFLGLDQ---KKISISTFVYA
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                                                                                                                                                                                                                                                                                                   KESKMLNKTFGEKLILHYVNAANVEINEFSKOVTDWELNOGFN 452
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TITLE OF INVENTION: Identification of Esser
TITLE OF INVENTION: Prokaryotes.
TITLE REFERENCE: ELITRA.OILA
CURRENT APPLICATION NUMBER: US/09/815,242
CURRENT FILING DATE: 2001-03-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NUMBER OF SEQ ID NOS: 14110
SOFTWARE: FastSEQ for Windows Version 4.0
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PRIOR APPLICATION NUMBER: 60/191,078
PRIOR FILING DATE: 2000-03-21
PRIOR PILING DATE: 2000-03-21
PRIOR PLILING DATE: 2000-05-23
PRIOR PELING DATE: 2000-05-26
PRIOR PELING DATE: 2000-05-26
PRIOR APPLICATION NUMBER: 60/242,578
PRIOR APPLICATION NUMBER: 60/242,578
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR FILING DATE: 2000-11-27
PRIOR FILING DATE: 2000-11-27
PRIOR PILING DATE: 2000-12-27
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR PILING DATE: 2000-12-27
PRIOR APPLICATION NUMBER: 60/253,931
PRIOR APPLICATION NUMBER: 60/253,931
PRIOR FILING DATE: 2000-12-22
PRIOR FILING DATE: 2001-02-16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence 13378, Application US/09815242
Patent No. US20020061569A1
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ohlsen, Kari L.
Zyskind, Judith W.
Wall, Daniel
Trawick, John D.
Carr, Grant J.
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Xu, H. Howard
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Best Local Similarity 27.29
Matches 128; Conservative
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                                  353 IGGADLNPYLAFSAIIAAGISGIBEKLELPPPASGNVY--NDKE----LPEFPNSLQNA 405
                                                                                                                          338 SVDPAANPYMALAAILEAGLDGIKNKLKVPEPVNQNIYEWNRERREAVGIQDLPSTLYTA 397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   62 GIAGGGYEISSVDTGYSDCHLCADLNSLHLLPWS--EGAVLAISNPHNFVTSEPLFCSPR 119
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           112 ANLKRVLKEMEDLGFTDFNLGPEPEFFLFKLDEK-------GEPTLELNDDGGYF 159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    173 NISASSGIETFMRSVRNKLEEAGILMEATHPEFLPSQHELNFVPADPLTMADRHIIAKHG 232
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                                                                                                                                                                                                    THLLKESKMLNKTFGEKLILHYVNAANVEINEFSKQVTDWELNQGFNRY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT: AYSKING, JUGATEN W.
APPLICANT: AYSKING, JOHN D.
APPLICANT: Trawick, John D.
APPLICANT: Carr, Grant J.
APPLICANT: Carr, Grant J.
APPLICANT: Xu, Howard
TITLE OF INVENTION: Identification of Essential Genes in
TITLE OF INVENTION: Prokaryotes
TITLE OF INVENTION: PROKARYOTES
TITLE OF INVENTION: PROKARYOTES
TITLE OF INVENTION: PROKARYOTES
TITLE OF INVENTION: PROKARYOTES
TITLE OF INVENTION: PROKARYOTES
TITLE OF INVENTION: PROKARYOTES
TITLE OF INVENTION NUMBER: 60/201,078
PRIOR FILING DATE: 2000-03-21
PRIOR FILING DATE: 2000-05-23
PRIOR FILING DATE: 2000-05-23
PRIOR FILING DATE: 2000-10-23
PRIOR FILING DATE: 2000-10-23
PRIOR FILING DATE: 2000-110-23
PRIOR FILING DATE: 2000-110-23
PRIOR FILING DATE: 2000-110-23
PRIOR FILING DATE: 2000-112-22
PRIOR FILING DATE: 2000-112-22
PRIOR FILING DATE: 2000-112-22
PRIOR FILING DATE: 2001-12-22
PRIOR FILING DATE: 2001-12-22
PRIOR APPLICATION NUMBER: 60/269,308
PRIOR FILING DATE: 2001-02-16
NUMBER OF SEQ ID NOS: 14110
SSOFTWARE: FRESEEQ for Windows Version 4.0
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                                                                                                                                                                                                                                                                                                                                                                                Sequence 12338, Application US/09815242
Patent No. US20020061569A1
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                            112 ANLKRVLKEMEDLGFTDFNLGPEPEFFLFKLDEK-------GEPTLELNDDGGYF 159
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   120 VILMQQIERLANLKLKGL-FASELEFNLFNETYKSASQKHWKNLKTAQPHHQ-----WM 172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   173 NISASSGIETFMRSVRNKLEEAGILMEATHPEFLPSQHELNFVPADPLTMADRHIIAKHG 232
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  DKE-----LPEFPNSLQNATHLLKESKMLNKTFGEKLILHYVNAANVEINEFSKQVTDWE
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26.2%; Pred. No. 2.7e-35;
ive 92; Mismatches 211;
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APPLICANT: Zyskind, Judith W.
APPLICANT: Zyskind, Judith W.
APPLICANT: Trawick, John D.
APPLICANT: Trawick, John D.
APPLICANT: Yamamoto, Robert T.
APPLICANT: Yamamoto, Robert T.
TITLE OF INVENTION: Identification of Essent TITLE OF INVENTION: Prokaryotes
FILE REPERENCE: ELITRA.011A
CURRENT APPLICATION NUMBER: US/09/815,242
CURRENT FILING DATE: 2001-03-21
PRIOR APPLICATION NUMBER: 10708
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PRIOR APPLICATION NUMBER: 60/269,308
PRIOR FILING DATE: 2001-02-16
NUMBER OF SEQ ID NOS: 14110
SOFTWARE: FastSEQ for Windows Version 4.0
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PRIOR APPLICATION NUMBER: 60/206,848
PRIOR FILING DATE: 2000-05-23
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR FILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-10-27
PRIOR APPLICATION NUMBER: 60/242,578
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR FILING DATE: 2000-11-27
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR FILING DATE: 2000-11-27
                                                                                                                                                                                                                                                                          Sequence 5733, Application US/09815242
Patent No. US20020061569A1
GENERAL INFORMATION:
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Best Local Similarity 26.2%;
Matches 123; Conservative
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  173 NISASSGIETFWRSVRNKLEEAGILMEATHPEFLPSQHELNFVPADPLTWADRHIIAKHG 232
                                                                                              233 VREMAEQSGWVATFWAKLSSTALGNACHIHMSLQDAETEKWAFYDQNDEYGMSTLARNWI 292
                                                                                                                         220 VKTIARKHNLHATFMPKPLFGVNGSGMFNVSL--FKGKENAFFDPNTEMGLIETAYQFT 277
                                                                                                                                                                                                                          353 IGGADLNPYLAFSAIIAAGISGIEEKLELPPPASGNVY--NDKE-----LPEFPNSLQNA 405
                                                                                                                                                                                                                                                                                                                                     338 SVDPAANPYMALAAILEAGLDGIKNKLKVPEPVNONIYEMNREEREAVGIQDLPSTLYTA 397
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                                                                                                                                                                                          293 AGLLKYVPEATYFFASYINSYKRLQPLTFAPTKCCWAIDNRTSAFRLCNSKSEGINVELR
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: Xu, H. Howard
TITLE OF INVENTION: Identification of Essential Genes in
TITLE OF INVENTION: Prokaryotes
FILE REFERENCE: ELITRA.011A
CURRENT APPLICATION NUMBER: US/09/815,242
CURRENT FILING DATE: 2001-03-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRIOR FILING DATE: 2001-03-21
PRIOR FILING DATE: 2000-03-21
PRIOR FILING DATE: 2000-03-21
PRIOR FILING DATE: 2000-05-23
PRIOR FILING DATE: 2000-05-23
PRIOR PELING DATE: 2000-05-26
PRIOR PILING DATE: 2000-05-26
PRIOR PILING DATE: 2000-00-23
PRIOR PILING DATE: 2000-010-23
PRIOR PILING DATE: 2000-10-23
PRIOR APPLICATION NUMBER: 60/242,578
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR APPLICATION NUMBER: 60/259,931
PRIOR APPLICATION NUMBER: 60/259,931
PRIOR APPLICATION NUMBER: 60/259,931
PRIOR APPLICATION NUMBER: 60/259,931
PRIOR PILING DATE: 2001-12-2
PRIOR PILING DATE: 2001-02-16
NUMBER OF SEQ ID NOS: 14110
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Zyskind, Judith W.
Wall, Daniel
Trawick, John D.
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ORGANISM:
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                                                                                                                                                                                                                     AGLLKYVPEATYFFASYINSYKRLQPLTFAPTKCCWAIDNRTSAFRLCNSKSEGINVELR 352
                                                                                                                                      278 AGVLKNARGFTAVCNPLVNSYKRLVPGYEAPCYIAWSGKNRSPLIRVPSSRGLSTRIEVR 337
                                                                                                                                                                                       353 IGGADLNPYLAFSAIIAAGISGIEEKLELPPPASGNVY--NDKE-----LPEFPNSLQNA 405
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VREMAEQSGMVATFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLARNWI 292
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                             398 LKAMRENEVIKKALGNHIYNQFINSKSIEWDYYRTQVSEWERDQYMKQY 446
                                                                                                                                                                                                                                                                                   406 THLLKESKMLNKTFGEKLILHYVNAANVEINEFSKQVTDWELNQGFNRY 454
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TITLE OF INVENTION: Prokaryotes
FILE REFERENCE: ELITRA.011A
CURRENT APPLICATION WUMBER: US/09/815,242
CURRENT FILING DATE: 2001-03-21
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SOFTWARE: FastSEQ for Windows Version 4.0
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PRIOR FILING DATE: 2000-03-21
PRIOR APPLICATION NUMBER: 60/206,848
PRIOR FILING DATE: 2000-05-23
PRIOR PILING DATE: 2000-05-26
PRIOR PELING DATE: 2000-05-26
PRIOR APPLICATION NUMBER: 60/242,578
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR FILING DATE: 2000-10-27
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR PILING DATE: 2000-11-27
PRIOR FILING DATE: 2000-11-27
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR PILING DATE: 2000-12-27
PRIOR APPLICATION NUMBER: 60/253,931
PRIOR FILING DATE: 2000-12-22
PRIOR FILING DATE: 2001-02-16
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GENERAL INFORMATION:
APPLICANT. "
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APPLICANT: Zyskind, Judith W.
APPLICANT: Wall, Daniel
APPLICANT: Trawick, John D.
APPLICANT: Trawick, John D.
APPLICANT: Yamamoto, Robert T.
APPLICANT: Xu, H. Howser?
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Best Local Similarity 26.24
Matches 123; Conservative
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170 KVRYKGGYFPTPPVDHFADLRAEISLE------LANSGLQVERQHHEVGTAGQAEIN 220
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                                                                                                                YDONDEYGMSTLARNWIAGLLKYVPEATYFFASYINSYKRLOPLTFAPTKCCWAIDNRTS 335
                                                                                                                                                                                                            336 AFR--LCNSKSEGINVELRIGGADLNPYLAFSAIIAAGISGIEEKLELPPPASGNVY--- 390
                                                                                                                                                                                                                                       66 GGYEISSVDTGY-SDCHLCADLNSLHLLPWSEGAVLAIS-NPHNFVTSEPLFCSPRVILM 123
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                                                                                                                                              :|:: |:| :| :| | :| |:| HDESGYAGLSDIARYYIGGILHHAGAVLAFTNATLNSYHRLVPGFEAPINLVYSQRNRSA
                      PADPLTMADRHIIAKHGVREMAEQSGMVATFMAKLSSTALGNACHIHMSLQDAETEKNAF
                                                 6 DELNNLIRNGKIDTVVLACVDMQGRLMGKRLTGRHFLGLDQKKISISTFVYAVTIEGIAG
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                                                                                                                                                                                                                                                                                                                                         PEEAASIPQAPISLEASLKALQEDIDFLIESDV----FIEDLIEAYI 451
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; Pred. No. 2.8e-21;
68; Mismatches 189;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT: SAKAKI, YOSHIYUKI
APPLICANT: HATTORI, MASAHIRA
TITLE OF INVENTION: NOVEL POLYNUCLEOTIDES
CURRENT APPLICATION NUMBER: US/10/156,761
CURRENT FILING DATE: 2002-05-29
PRIOR PILING DATE: 2001-05-30
PRIOR APPLICATION NUMBER: JP 2001-27489
PRIOR FILING DATE: 2001-05-30
PRIOR APPLICATION NUMBER: JP 2001-272697
PRIOR PILING DATE: 2001-06-02
NUMBER OF SEQ ID NOS: 15109
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HORIKAWA, HIROSHI
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Best Local Similarity 25.9°
Matches 113; Conservative
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US-10-156-761-13532
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                                                                                                                                                                                                                                                                                                                     64 AGGGYEISSVDT-GYSDCHLCADLNSLHLLPWSEGAVLAIS-NPHNFVTSEPLFCSPRVI 121
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                                                                                                                       239 MPKPLFGINGSGMHCNMSL--FNEEGNVFYDESGEMGLSQTAYHFLGGLLKHARAYTAVC 296
                                          179 IVLELESLGFEVEASHHEVAPGQHEIDFKYADVVDACDNIQTFKLVVKTIARKHGLHATF 238
                                                                                            247 MAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLARNWIAGLLKYVPEATYFF 306
                                                                                                                                                                                        307 ASYINSYKRLOPLTFAPTKCCWAIDNRTSAFRLCNSKSEGINVELRIGGADLNPYLAFSA 366
                                                                                                                                                                                                                                     297 NPTVNSYKRLVPGYEAPVYVAWSGRNRSPLIRVPESRGLSTRLELRSVDPSANPYLTMAV 356
                                                                                                                                                                                                                                                                                       367 IIAAGISGIEEKLELPPPASGNVY--NDKE-----LPEFPNSLQNATHLLKESKMLNKTF 419
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VRNKLBEAGILMEATHPEFLPSQHELNFVPADPLTMADRHI LAKHGVREMAEQSGMVATF
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26.6%; Pred. No. 1.6e-24;
tive 74; Mismatches 207; Indels
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APPLICANT: YOKOI, HARUHIKO
APPLICANT: YOKOI, HARUHIKO
APPLICANT: SENOH, AKIHIRO
APPLICANT: SENOH, AKIHIRO
APPLICANT: IKEDA, MASATO
APPLICANT: IKEDA, MASATO
APPLICANT: OZAKI, AKI
CORRENT: APPLICATION NUMBER: US/09/738,626
CURRENT RAPLICATION NUMBER: US/09/738,626
CURRENT FILING DATE: 2000-12-18
PRIOR FILING DATE: 2000-14-07
PRIOR FILING DATE: 2000-04-07
PRIOR FILING DATE: 2000-04-07
PRIOR FILING DATE: 2000-04-07
PRIOR APPLICATION NUMBER: UP 00/159162
PRIOR FILING DATE: 2000-04-07
PRIOR FILING DATE: 2000-08-03
NUMBER OF SEQ ID NOS: 7059
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 6985, Application US/09738626 Publication No. US20020197605A1 GENERAL INFORMATION: APPLICANT: NAKAGAWA, SATOSHI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MIZOGUCHI, HIROSHI
ANDO, SEIKO
HAYASHI, MIKIRO
OCHIAI, KEIKO
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332 NRTSAFRL-CNSKSEGINVELRIGGADLNPYLAFSAIIAAGISGIEEKLELPPPASGNVY 390
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                                                                                                                                                                                                                                                                          391 N-----DKELPEFPNSLQNATHLL-KESKMLNK--TFGEKLILHYVNAANVEINEFS 439
                                                                                                                                                                                                                                                                                                                 :: | :: | :: | :: | : | : | : | : | :: | :: | :: | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
                                                                                                                                                                                 16 KIDTVVLACVDMQGRLMGKRLTGRHFL----GLDQKKISISTFVY----AVTIEGIAGG
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APPLICANT: Short, Jay M.
APPLICANT: Varoglu, Mustafa
APPLICANT: Varoglu, Mustafa
APPLICANT: Watch, Exic J.
TITLE OF INVENTION: GLYCOSYLATED KINAMYCINS AND METHODS OF TITLE OF INVENTION: MAKING AND USING THEM
FILE REPERENCE: 90910-280001
CURRENT APPLICATION NUMBER: US/10/187, 267A
CURRENT FILING DATE: 2003-01-27
PRIOR APPLICATION NUMBER: US 60/301, 401
PRIOR PILING DATE: 2001-06-27
NUMBER OF SEQ ID NOS: 65
SOFTWARE: FastSEQ for Windows Version 4.0
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Best Local S
Matches 122
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                                       SAAMRIPITGSNPKAKRVEFRAPDSSGNPYLAFSALLLAGLDGIKNKVEPAEPIDKDLYE 398
TSAFR--LCNSKSEGINVELRIGGADLNPYLAFSAIIAAGISGIEEKLELPPPASGNVY- 390
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APPLICANT: Haselbeck, Robert
APPLICANT: Obleen, Kari L.
APPLICANT: Zyskind, Judith W.
APPLICANT: Zyskind, Judith W.
APPLICANT: Travick, John D.
APPLICANT: Travick, John D.
APPLICANT: Travick, John D.
APPLICANT: Travick, John D.
APPLICANT: Yamamoto, Robert T.
APPLICANT: Yamamoto, Robert T.
APPLICANT: Vu, H. Howard
TITLE OF INVENTION: Identification of Essent;
TITLE OF INVENTION: Dentification of Essent;
TITLE OF INVENTION: LOGNIFICATION OF PROKATYORS
FILE REFERENCE: ELITRA.011A
CURRENT FILING DATE: 2000-03-21
PRIOR FILING DATE: 2000-05-23
PRIOR FILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-10-23
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SOFTWARE: FastSEQ for Windows Version 4.0
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LAPEEHASVAQVPTSL 414
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LENGTH: 472
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Best Local Simi
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325 KCCWAIDNRTSAFRL-CNSKSEGINVELRIGGADLNPYLAFSAIIAAGISGIEEKLELPP 383
                                                                         332 MLAYSARNKSASIRIPYVSSPKARRIEARFPDPAANPYLAFAALLMAGLDGIQNKIHPGD 391
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APPLICANT: Carr, Grant J.
APPLICANT: Carr, Grant J.
APPLICANT: Yamamoto, Robert T.
APPLICANT: Xu, H. Howard
TITLE OF INVENTION: Identification of Essential Genes in
TITLE OF INVENTION: Devaryotes
FILE REFRENCE: ELITRA.011A
FILE REFRENCE: ELITRA.011A
CURRENT FILING DATE: 2001-03-21
PRIOR APPLICATION NUMBER: 60/191,078
PRIOR FILING DATE: 2000-05-23
PRIOR PELING DATE: 2000-05-23
PRIOR PILING DATE: 2000-05-26
PRIOR PLING DATE: 2000-05-26
PRIOR PLING DATE: 2000-10-23
PRIOR FILING DATE: 2000-11-27
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SOFTWARE: FastSEQ for Windows Version 4.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence 11507, Application US/09815242
Patent No. US20020061569A1
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US-09-815-242-11507
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Trawick, John D.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             20
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6 HQLIKDHDVKWVDLRFTDTKGKQQHVTMPARD--ALDDEFFE------AGKMF
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT: CALIBEN, MAIL Daniel
APPLICANT: Zyskind, Judith W.
APPLICANT: Wall, Daniel
APPLICANT: Trawick, John D.
APPLICANT: Carr, Grant J.
APPLICANT: Carr, Grant J.
APPLICANT: Yamamoto, Robert T.
APPLICANT: Yamamoto, Robert T.
APPLICANT: Yamamoto, Robert T.
APPLICANT: Yamamoto, Robert T.
TITLE OF INVENTION: Identification of Essential Genes in
TITLE OF INVENTION: Derokaryotes
FILE REFERENCE: ELITAN.011A
CURRENT APPLICATION NUMBER: 00/191,078
PRIOR APPLICATION NUMBER: 00/191,078
PRIOR FILING DATE: 2000-03-21
PRIOR FILING DATE: 2000-05-26
PRIOR PELING DATE: 2000-05-26
PRIOR PELING DATE: 2000-05-26
PRIOR PELING DATE: 2000-10-23
PRIOR PELING DATE: 2000-10-23
PRIOR FILING DATE: 2000-11-27
PRIOR PELING DATE: 2000-11-27
PRIOR PELING DATE: 2000-11-27
PRIOR PELING DATE: 2000-11-27
PRIOR PELING DATE: 2000-12-21
PRIOR PELING DATE: 2010-12-16
PRIOR PELING DATE: 2010-21-16
PRIOR PELING DATE: 2010-21-10
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                                                                                                                                                                                                                                                                                                            Sequence 12088, Application US/09815242
Patent No. US20020661569A1
GENERAL INFORMATION:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ohlsen, Kari L.
Zyskind, Judith W.
Wall, Daniel
                                                                                       495 EYFEAF 500
    449 QGFNRY 454
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Sequence 17901, A
Sequence 27559, A
Sequence 28048, A
Sequence 27833, A
Sequence 4173, Ap
Sequence 19014, A
Sequence 16796, A
Sequence 16796, A
Sequence 1860, A
Sequence 1860, A
Sequence 1860, A
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Sequence 2, Appli
Sequence 3, Appli
Sequence 29534, A
                                                                                                        December 17, 2003, 22:43:05; Search time 19 Seconds (without alignments) 1011.007 Million cell updates/sec
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/cgn2_6/ptodata/2/jaa/6A_COMB.pep:*
/cgn2_6/ptodata/2/jaa/PCTUS_COMB.pep:*
/cgn2_6/ptodata/2/jaa/PCTUS_COMB.pep:*
GenCore version 5.1.6
(c) 1993 - 2003 Compugen Ltd.
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US-09-252-991A-27559
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US-09-252-991A-19014
US-09-252-991A-18960
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US-09-252-991A-18960
US-09-328-352-4633
US-09-328-352-4633
US-09-107-522A-6200
US-08-471-044-50
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US-09-028-366-3
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Maximum Match 100%
Listing first 45 summaries
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Gapop 10.0 , Gapext 0.5
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Match I
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Sequence 5311, A	Sequence 21, App	Sequence 8, Appl	Sequence 9, Appl	Sequence 3159, A	Sequence 4383, A	Seguence 4551, A	Seguence 18769,	Sequence 3,	Sequence 3, Appl	Sequence 3,	Sequence 79, App	Sequence 7993, A	Seguence 5599, A	Sequence 4, Appl	Sequence 5, Appl	Sequence 5486, A	Sequence 4810, A
US-09-134-001C-5311	US-08-335-865J-21	US-09-415-522-8	US-08-335-865J-9	US-09-134-001C-3159	US-09-134-001C-4383	US-09-328-352-4551	US-09-252-991A-18769	US-09-036-987A-3	US-09-370-700-3	US-09-603-207-3	US-09-254-776B-79	US-09-328-352-7993	US-09-328-352-5599	US-07-912-015-4	US-09-063-950-5	US-09-328-352-5486	US-09-107-532A-4810
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91	91	91	90	06	89.5	89.5	88.5	88	88	88	87.5	87	87	87	86.5	86.5	98
58	59	30	31	-, 32	33	34	35	36	37	38	39	40	41	42	43	44	45

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GENERAL INCORNATION:
APPLICANT: Marc J. Rubenfield et al.
APPLICANT: Marc J. Rubenfield et al.
TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO PSEUDOMONAS TITLE OF INVENTION: AERUGINOSA FOR DIAGNOSTICS AND THERAPEUTICS
FILE REFERENCE: 107196.136
CURRENT APPLICATION NUMBER: US 60/074,788
PRIOR APPLICATION NUMBER: US 60/074,788
PRIOR FILING DATE: 1998-02-18
PRIOR FILING DATE: 1998-07-27
NUMBER OF SEQ ID NOS: 33142
SEQ ID NOS: 33142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 80 CHLCADLNSLHLLPWSEGAVLAISNPHNFVTSE-----PLFCSPRVILMQQIERLANL 132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    133 KLKGLFASELEFNLF----NETYKSASOKHWKNLKTAOPHHOWMNISASSGIETFMRS 186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 187 VRNKLEEAGILMEATHPEFLPSQHELNFVPADPLTMADRHIIAKHGVREMAEQSGMVATF 246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        247 MAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLARNWIAGLLKYVPEATYFF 306
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ; Score 481; DB 4; Length 449;
; Pred. No. 2.2e-44;
94; Mismatches 181; Indels
ALIGNMENTS
                                                                                          Sequence 17901, Application US/09252991A Patent No. 6551795
                                                                                                                                                                                                                                                                                                                                                                                               ; TYPE: PRT
; ORGANISM: Pseudomonas aeruginosa
US-09-252-991A-17901
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28.9%;
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Best Local Similarity 28.9%
Matches 128; Conservative
                                                       RESULT 1
US-09-252-991A-17901
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TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO PSEUDOMONAS TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO PSEUDOMONAS TITLE OF INVENTION: ARRUGINOSA FOR DIAGNOSTICS AND THERAPEUTICS CURRENT APPLICATION NUMBER: US/09/252,991A CURRENT APPLICATION NUMBER: US 60/074,788 PRIOR FILING DATE: 1998-02-18 PRIOR FILING DATE: 1998-02-18 PRIOR FILING DATE: 1998-07-27 NUMBER OF SEQ ID NOS: 33142 SEQ ID NO 28048
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TITLE OF INVENTION: MUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO PSEUDOMONAS TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO PSEUDOMONAS TITLE OF INVENTION: ARRUGINOSA FOR DIAGNOSTICS AND THERAPEUTICS.

FILE REFERENCE: 107196.136
CURRENT APPLICATION NUMBER: US 60/074,788
PRIOR FILING DATE: 1999-02-18
PRIOR FILING DATE: 1999-07-27
NUMBER OF SEQ ID NOS: 33142
SEQ ID NO 27833
LENGTH: 489
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLARNWIAGLLKYVPEATYF 305
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                                                                                                                                                                                                                                                                                                                                                                                                                    22;
                                                                                                                                                                                                                                                                                                                                                                      ; Score 455; DB 4; Length 46; Pred. No. 1.9e-41; 86; Mismatches 211; Indels
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; Patent No. 6551795
; GENERAL INFORMATION:
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                                                                                                                                                                                                                                                                                   ; TYPE: PRT
; ORGANISM: Pseudomonas aeruginosa
US-09-252-991A-28048
                                                                                                                                                                                                                                                                                                                                                                        19.1%;
28.0%;
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TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO PSEUDOMONAS
TITLE OF INVENTION: ARRUGINOSA FOR DIAGNOSTICS AND THERAPEUTICS
TITLE OF INVENTION: ARRUGINOSA FOR DIAGNOSTICS AND THERAPEUTICS
CURRENT APPLICATION NUMBER: US/09/252,991A
CURRENT FILING DATE: 1999-02-18
PRIOR PILING DATE: 1998-02-18
PRIOR PILING DATE: 1998-02-18
PRIOR FILING DATE: 1998-07-27
NUMBER: 1998-07-27
NUMBER OF SEQ ID NOS: 33142
LENGTH: 464
                    363 SLAAGLYGLEHELE-PSPA---IQGEFEVPEELTLPCTMYDALRRLKGSALARELFGSEF 418
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IIAAGISGIEEKLELPPPASGNVYNDKELPE
                                                                                                                                                                                                                                     Sequence 27559, Application US/09252991A
Patent No. 6551795
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; Sequence 28048, Application US/09252991A
; Patent No. 6551795
; GENERAL INFORMATION:
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US-09-252-991A-27559
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TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO PSEUDOMONAS TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO PSEUDOMONAS TITLE OF INVENTION: AERGINOSA FOR DIAGNOSTICS AND THERAPEUTICS TITLE OF INVENTION: AERGINOSA FOR DIAGNOSTICS AND THERAPEUTICS CURRENT APPLICATION NUMBER: US/09/252,991A CURRENT FILING DATE: 1999-02-18 PRIOR APPLICATION NUMBER: US 60/074,788 PRIOR APPLICATION NUMBER: US 60/074,788 PRIOR FILING DATE: 1998-02-18 PRIOR FILING DATE: 1998-02-18 PRIOR APPLICATION NUMBER: US 60/094,190 NUMBER OF SEQ ID NOS: 33142
                                                                                                                                                                                                                                                                                                                360 EAGLDGIENKLEVPEPVNQNIYEMNREEREAVGIQDLPSTLYTALKAMRENKSIKNALGN 419
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                                                                                                                                                                                                                                         300 IVNSYKRLVPGYBAPCYIAWSGKNRSPLVRVPTSRGLSTRIEVRSVDPAANPYMALAAIL 359
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 285 STLARNWIAGLLKYVPEATYFFASYINSYKRL-----OPLTFAPTKCCWAIDNRTSAFR 338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            352 TPLAYHFIAGVLKHAKAICAVIAPTVNSYKRLIRKGAMSGSTWAPVFCCYGNNNRTNMLR 411
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                                                  KLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLARNWIAGLLKYVPEATYFFAS
                                                                                                                                      242 KPLFGVNGSGMHFNVSL--FKGKENAFFDPEGDLQLTDTAYQFTAGVLKNARGFTAVCNP
                                                                                                                                                                                             309 YINSYKRLOPLTFAPTKCCWAIDNRTSAFRLCNSKSEGINVELRIGGADLNPYLAFSAII
                         189 NKLEEAGILMEATHPEFLPSQHELNFVPADPLTMADRHIIAKHGVREMAEQSGMVATFMA
                                                                                                                                                                                                                                                                                    AAGISGIEEKLELPPPASGNVY--NDKE-----LPEPPNSLQNATHLLKESKMLNKTFGE
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                                                                                                                                                                                                                                                                                                                                                                                                  HIYNOFINSKSIEWDYYRTOVSEWEREGYIKOY 452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ; Sequence 26690, Application US/09252991A; Patent No. 6551795; GENERAL INFORMATION:
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US-09-252-991A-26690
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132; Conserv
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Best Local S:
Matches 132
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APPLICANT: Lynn Doucette-Stamm et al TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO STAPHYLOCOCCUS TITLE OF INVENTION: BPIDERMIDIS FOR DIAGNOSTICS AND THERAPEUTICS FILE REFERENCE: GTC-007

CURRENT APPLICATION NUMBER: US/09/134,001C

CURRENT PILING DATE: 1998-08-13

PRIOR FILING DATE: 1997-11-08

PRIOR FILING DATE: 1997-11-08

PRIOR FILING DATE: 1997-14
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                                                                                                                                                                                                                                                                  207 RQSFSIDAANBFDPLFEDMYDWCEAQGLDLDTLIHEEGTAQMBINFRHGDALDLADQILV 266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AKHGVREMAEQSGMVATFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLA 288
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  78 SDCHLCADLNSLHLLPWS--EGAVLAISNPHNFVTSEPLFCSPRVILMQQIERLANLKLK 135
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                                                                                                                                                                                                                                                                                                                                                                                                                    HOWMNISASSGIETFWRSVRNKLEEAGILMEATHPEFLPSOHELNFVPADPLTMADRHII 228
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                                                                                                                                                      မွ
                                                                                                                                                                                267 FKRTMREAALKHNVAATFMAKPMTGEPGSAMHLHOSIVDVKTGKNIF--SNADGTMSELF
                                                                                                                                                    MILIYDELNNLIRNGKIDTVVLACVDMQGRLMGKRLTGRHFLGLDOKKISISTFVYAVTI
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                                                                                                             Gaps
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                                                             18.9%; Score 450; DB 4; Length 48 28.4%; Pred. No. 7.3e-41; tive 80; Mismatches 222; Indels
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US-09-134-001C-4173
; ORGANISM: Pseudomonas aeruginosa
US-09-252-991A-27833
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Best Local Similarity 28.2%
Matches 111; Conservative
                                                                                                         Matches 130; Conservative
                                                           Query Match
Best Local Similarity
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ORGANISM:
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TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO ACINETOBACTER TITLE OF INVENTION: BAUMANNII FOR DIAGNOSTICS AND THERAPEUTICS FILE REFERENCE: GTC99-03PA
                                                                                                                                                                                                                                                             Indele
                                                                                                                                                                                                                         Query Match 14.0%; Score 331.5; DB 4; Best Local Similarity 25.7%; Pred. No. 1.1e-27; Matches 117; Conservative 76; Mismatches 187;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               417 KTFGEKLILHYVNAANVEINEFSKOVTD----WEL 447
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                 CURRENT FOLIAGE GTC99-03PA
CURRENT APPLICATION NUMBER: US/09/328,352
CURRENT FILING DATE: 1999-06-04
NUMBER OF SEQ ID NOS: 8252
1. DELLOS
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                                                                                                                                                                                                                                                                                                                                                                                                           123 LPILGSLOPSALSPELNAQLYLSMQE-
                                                                                                                                                                    ; ORGANISM: Acinetobacter baumannii
US-09-328-352-6949
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US-09-252-991A-16796
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       106 TGLVWDVGDADCWTFPLPGSLTLQPWRQSPTGQVQVSMHPELGLPAAA--GDPRHVLQRV 163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IERLANLKIKGLFASELEFNLFNETYKS-----ASQKHWKNLKTAQPHHQWMNISASSG 179
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                                                                                 469 OMGIETLPRTLSEAIDAFEADPLSRQVFGDAMYQAFVEFKRDEWNAYHTHVSDWEIQR 526
                                                            ---LPEFPNSLQNATHLLKESKMLNKTFGEKLILHYVNAANVEINEFSKQVTDWELNQ 449
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                                                                                                                                                                               Sequence 19014, Application US/09252991A

Patent No. 6551795

GENERAL INFORMATION:
TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELY
TITLE OF INVENTION: AERUGINOSA FOR DIAGNOSTICS AND THERAPEUTIC;
FILE REFERENCE: 107196,136

CURRENT APPLICATION NUMBER: US/09/252,991A

CURRENT APPLICATION NUMBER: US 60/074,788

PRIOR FILING DATE: 1998-02-18

PRIOR FILING DATE: 1998-02-18

PRIOR FILING DATE: 1998-07-27

NUMBER OF SEQ ID NOS: 33142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         14.5%; Score 344.5; DB 4;
26.8%; Pred. No. 4e-29;
Live 73; Mismatches 231;
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Patent No. 6562958
BARERAL INFORMATION:
APPLICANT: Gary L. Breton et al.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Pseudomonas aeruginosa
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Matches 122; Conserv
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GENERAL INFORMATION:

APPLICANT: Marc J. Rubenfield et al.

APPLICANT: Marc J. Rubenfield et al.

TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO PSEUDOMONAS TITLE OF INVENTION: ARRUGINOSA FOR DIAGNOSTICS AND THERAPEUTICS

FILE. REFERENCE: 107196.136

CURRENT APPLICATION NUMBER: US/09/252,991A

CURRENT FILING DATE: 1999-02-18

PRIOR FILING DATE: 1998-02-18

PRIOR FILING DATE: 1998-07-27

NUMBER OF SEQ ID NOS: 33142 NAME/KEY: UNSURE LOCATION: (769) OTHER INFORMATION: Identity of amino acid at the above locations are unknown. 14; ----EDGSGCRYEPRNILKKLLNQ 168 304 YFFASYINSYKRLQPLTFAPTKCCWAIDNRTSAFRLCNSKSEGINVELRIGGADLNPYLA 363 334 AILAPNINSYRRFKIGHHVPLEANWDTNNRNVAIRIPCSDVQNQRLEYRVAGADCNPYLV 393 364 FSAIIAAGISGIEEKLELPPPASGNVYNDKELPEFP-----NSLQNATHLLKESKMLN 416 68 DLNGHIRGKRIDVKSL----KNLSNGCYFPLSVYAMSLDGKVIEETGLGKYIGEPDRLC 122 244 ATFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLARNWIAGLLKYVPEAT 303 394 TATILAGASYGLSHKLPLPKPA-----HLLKFPDEHILLANNQPEALKIFKGSLILK 445 169 LHANNYFPVMAAELEFYLFSPQHQS-----EICSENQCFDIDAPNNYQ----QVL 76 ----GYSDCHLCADLNSLHLLPWSEGAVLAISNPHNFVTSEPLFC--SPRVILMQQIER LANLKLKGLFASELEFNLFNETYKSASOKHWKNLKTAOPHHOWMNISASSGIETFMRSVR NKLEEAGIL-----MEATHPEFLPSQHELNFV-PADPLTMADRHIIAKHGVREMAEQSGMV 26 DMQGRLMGKRLTGRHFLGLDQKKISISTF----VYAVTIEG----IAGGGYEISSVDT--Gaps 75; Length 480;

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Sequence 32811, Application US/09252991A

Sequence 32811, Application US/09252991A

Patent No. 6551795

GENERAL INFORMATION:
APPLICANT: Marc J. Rubenfield et al.
APPLICANT: Marc J. Rubenfield et al.
APPLICANT: Marc J. Rubenfield et al.
APPLICANT: MOUBLE CAID AND AMINO ACID SEQUENCES RELATING TO PSEUDOMONAS
TITLE OF INVENTION: NUMBER: US/09/252,991A

FILE REFERENCE: 107196.136
CURRENT APPLICATION NUMBER: US 60/074,788
PRIOR APPLICATION NUMBER: US 60/074,788
PRIOR FILING DATE: 1998-02-18
PRIOR FILING DATE: 1998-07-27
NUMBER OF SEQ ID NOS: 33142

SEQ ID NO 32811
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   253 TALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLARNWIAGLLKYVPEATYFFASYINS 312
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                                          313 YKRLQPLTFAPTKCCWAIDNRTSAFRLCNSKSEG-----INVELRIGGADLNPYLAFS
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11.2%; Score 265.5; DB 4; Length 4
Best Local Similarity 24.8%; Pred. No. 2.3e-20;
Matches 119; Conservative 79; Mismatches 194; Indels
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US-09-252-991A-32811
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APPLICANT: Marc J. Rubenfield et al.
APPLICANT: Marc J. Rubenfield et al.
TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO PSEUDOMONAS TITLE OF INVENTION: NUCLEIC ACID AND THERAPEUTICS
FILE REFERENCE: 107196.136
CURRENT APPLICATION NUMBER: US, 60/074,788
PRIOR APPLICATION NUMBER: US, 60/074,788
PRIOR APPLICATION NUMBER: US, 60/094,190
PRIOR FILING DATE: 1999-02-18
PRIOR FILING DATE: 1999-07-27
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                                                                                                                                                                                                                                                                                                                                                                         193 SGLVWDVGDIDCRAYPLSGSLVRLPWRQIPTAAVQVSMHP----SEGLPASVADPRHLL
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                                                                                                                            Gaps
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                                                                 Length 1037;
                                                       ; Score 317; DB 4; Length 10; Pred. No. 1.7e-25; 67; Mismatches 200; Indels
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Patent No. 6551795
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                                                       Query Match
Best Local Similarity 27.34
Matches 113; Conservative
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Matches 99; Conservative
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US-09-252-991A-18960
US-09-252-991A-16796
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APPLICANT: Lynn A Doucette-Stamm and David Bush
TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO
ENTEROCOCCUS FAECIUM FOR DIAGNOSTICS AND THERAPEUTICS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           272 KNAFYDONDEYGMSTLARNWIAGLLKYVPEATYFFASYINSYKRLOPLTFAPTKCCWAID 331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            332 NRTSAFRLCNSKSEGINVELRIGGADLNPYLAFSAIIAAGISGIEEKLELPPPASGNVY- 390
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10.2%; Score 241.5; DB 4;
Best Local Similarity 29.5%; Pred. No. 2.1e-18;
Matches 56; Conservative 38; Mismatches 89:
                                   CURRENT APPLICATION DATA:

APPLICATION NUMBER: US/09/107,532A
FILING DATE: 30-Jun-1998
PRIOR APPLICATION DATA:
APPLICATION DATA:
APPLICATION DATA:
APPLICATION NUMBER: 60/085,598
FILING DATE: J4 May 1998
APPLICATION NUMBER: 60/051571
FILING DATE: July 2, 1997
ATTORNEY/AGENT INFORMATION:
NAME: Ariniello, Pamela Deneke
REGISTATION NUMBER: 40,489
REFERENCE/DOCKET NUMBER: GTC-012
TELECOMMUNICATION INFORMATION:
TELEFRANCE (781)893-6277
INFORMATION FOR SEQ ID NO: 4613:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ), NAME/KEY: misc_feature
LOCATION: (B) LOCATION 1...190
; SEQUENCE DESCRIPTION: SEQ ID NO: 4613:
US-09-107-532A-4613
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MEDIUM TYPE: CD/ROM ISO9660
COMPUTER: PC
OPERATING SYSTEM: <Unknown>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence 6200, Application US/09107532A Patent No. 6581275 GENERAL INFORMATION:
OPERATING SYSTEM: <Unknown>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STREET: 100 Beaver Street
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LENGTH: 190 amino acids TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CITY: Waltham
STATE: Massachusetts
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NUMBER OF SEQUENCES: 7310
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ADDRESSEE: GENOME
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MOLECULE TYPE: protein HYPOTHETICAL: YES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             445 WELNQGFNRY 454
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT 14
US-09-107-532A-6200
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                                                                                                              Sequence 4363, Application US/09328352
Patent No. 6562958
GENERAL INFORMATION:
FAPLICANT: Gary L. Breton et al.
TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO ACINETOBACTER TITLE OF INVENTION: BAUMANNI FOR DIAGNOSTICS AND THERAPEUTICS
FILE REFERENCE: GTC99-03PA
CURRENT PILING DATE: 1999-06-04
NUMBER OF SEQ ID NOS: 8252
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Patent No. 6583275
GENERAL INFORMITION:
APPLICANT: Lynn A Doucette-Stamm and David Bush
APPLICANT: Lynn A Doucette Acid AND AMINO ACID SEQUENCES RELATING TO
TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            12;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       234 REMAEQSGMVATFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEY-GMSTLARNWI 292
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    320 GGIIKHARALNAITNPSTNSYKRLVPHFEAPIMLAYSARNRSASIRIPYVSNPKGKRIËA 379
  398 AADKNLYDLPPEEAKEIPQVCGSLKEALEELDKGRAFLTKGGVFTDEFIDAYIELKSEE 456
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CORRESPONDENCE ADDRESS:
ADDRESSEE: GENOME THERAPEUTICS CORPORATION
STREET: 100 Beaver Street
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      10.8%; Score 255.5; DB 4; 24.7%; Pred. No. 3.1e-19; ive 57; Mismatches 156;
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MEDIUM TYPE: CD/ROM ISO9660
COMPUTER: PC
                                                                                                                                                                                                                                                                                                                                                                                                                                                 , ORGANISM: Acinetobacter baumannii
US-09-328-352-4363
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STATE: Massachusetts
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local Similarity 24.77
Matches 98; Conservative
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                                                                       RESULT 12
US-09-328-352-4363
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LENGTH: 489
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98;

DB 4; Length 481;

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92 LCADLNSLHLLPWSEGAVLAISNPHNFVTSEPLFCSPRVILMQQIERLANLKLKG--LFA 139
                                                                                                                               285 ----STLARNWIAGLLKYVPE----ATYFFASYINSYKRLOPLTFAPTKCCWAIDN--R 333
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                                                                                                                                                                                                                                                                                                                                                                                                                           248 IFAEE--WETFREQLIELWQGNIHHKREAVNYALDGQIRNVLLQFTVFPGYEETWGLVQ 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    334 TSAFRLCNSKSEGINVELRIGGADLNPYLAFSAIIAAGISGIEEKLELPPPASGNVY--- 390
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                                                                                                                                                                                                                                                                                    188 RNKLEEAGIL-----MEATHPEFLPSQHE-----LNFVPADPLTWADRHIIAKHGVR 234
                                                                                                                                                                                                                                                                                                                                                                             235 EMAEQSGWVATFMAKLSSTALGNACH-----IHMSLQDAETEKNAFYDQNDEYGM-- 284
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       4.0%; Score 95; DB 4; Length 481.
20.0%; Pred. No. 0.21;
tive 69; Mismatches 170; Indels
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Job time : 22 secs
                                                    84; Conservative
       Query Match
Best Local Similarity
Matches 84; Conserva
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TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO ACINETOBACTER
TITLE OF INVENTION: BAUMANNII FOR DIAGNOSTICS AND THERAPEUTICS
FILE REFERENCE: GTC99-03PA
CURRENT APPLICATION NUMBER: US/09/328,352
CURRENT FILING DATE: 1999-06-04
NUMBER OF SEQ ID NOS: 8252
SEQ ID NO 4580
LENGTH: 481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             63 IAGGGYEISSVDTGYSDCHLCADLNSLHLLPWSEG-----AVLAISNPHNFVTSEPLFC 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            68 F------VRIEESDMYLYPDLSTWMIFPWESAHGKVARLICDIYNP----DGTPFAG 114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         117 SPRVILMQQIERLANLK--LKGLFASELEFNLFNETYKSASQKHWKNLKTAQPHHQWMNI 174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  115 DPR-------GNLKRALKDM--RDLGFTSFN--------LGPEPEFFLFKL 148
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               12 ITGEEIKRIIEEENVRFLRLMFTDILGTIKKVEVPVSQIDKVLENKWMPD----GSSIEG 67
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APPLICATION NUMBER: US/09/107,532A
FILING DATE: 30-Jun-1998
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NAME/KEY: misc feature
LOCATION: (B) LOCATION 1...275
SEQUENCE DESCRIPTION: SEQ ID NO: 6200:
                                                                                                                                                                                                          NAME: Ariniello, Pamela Deneke
REGISTRATION NUMBER: 40,489
REFERENCE/DOCKET NUMBER: GTC-012
                                                                                         APPLICATION NUMBER: 60/085,598
FILING DATE: 14 May 1998
AAPPLICATION NUMBER: 60/051571
FILING DATE: July 2, 1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ORGANISM: Enterococcus faecium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence 4580, Application US/09328352
Patent No. 6562958
                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE CHARACTERISTICS:
LENGTH: 275 amino acids
TYPE: amino acid
TOPOLOGY: linear
MOLECULE TYPE: protein
HYPOTHETICAL: YES
ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                               TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                     TELEPHONE: (781)893-5007
TELEFAX: (781)893-8277
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; ORGANISM: Acinetobacter baumannii
US-09-328-352-4580
                                                                                                                                                                                         ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                   INFORMATION FOR SEQ ID NO: 6200:
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Streptococcus

Staphylococcus epi Enterococcus faeca Peptide with gluta Mycobacterium tube

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Mycobacterium tube Mycobacterium tube Propionibacterium Haemophilus influe Novel human diagno S. murayamaensis A

Helicobacter pylor N. gonorrhoeae ami Salmonella typhi c E. coli cellular p Novel human diagno Novel human diagno

Pseudomonas aerugi

S. pneumoniae deri Novel human enzyme Human ORF1611 prot Human ORFX ORF1241

New microorganism for converting isopropylamine to L-alaninol, useful

WPI; 2001-626266/72. N-PSDB; AAI68686.

C glutamicum prote Corynebacterium gl Lactococcus lactis Bifidobacterium lo

AAB79681 ABB55555 ABP66039 ABP27862

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Result Š. Streptococcus poly

Brevibacterium lac

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Run on:

Seguence:

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L-alaninol; isopropylamine; iupl; ipuH; ofloxacin; ipuC; glutamylamide; gamma-glutamylamide synthase; theanine.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                          ALIGNMENTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Pseudomonas sp KIE171-BII ipuC protein
                      AAE33506
ABU00865
                                                                               ABB48084
AAG82578
ABP39328
                                                                                                                               AAP93191
AAW37905
AAB96475
                                                                                                                                                                 ABB92646
AAG93231
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AAW37901
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ABG24868
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ABG25229
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AAB41477
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ABP80864
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                                               AAU34237
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Maire T;
 30-MAR-2001; 2001WO-EP03651
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(LONZ ) LONZA AG.
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  Pseudomonas sp KIE
Pseudomonas putida
Propionibacterium
                                                                               December 17, 2003, 22:37:15 ; Search time 39 Seconds (without alignments) 1847.740 Million cell updates/sec
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            GenCore version 5.1.6
(c) 1993 - 2003 Compugen Ltd.
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Listing first 45 summaries
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Minimum DB Maximum DB

Database

Searched:

De Azevedo Waesch SI;

Kiener AM,

Van Der Ploeg J,

Leisinger T,

Maire T;

(LONZ) LONZA AG

WPI; 2001-626266/72.

N-PSDB; AAI68692

30-MAR-2001; 2001WO-EP03651 31-MAR-2000; 2000EP-0106888

WO200173038-A2

04-OCT-2001

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This invention describes novel microorganisms (A), or their enzymatic extracts, able to convert isoproplamine (I) to L-alaninol (II) and which have the ipuH and ipuI genes, encoding enzymes involved in metabolism of (II), inactivated. (II) is an intermediate for pharmaceuticals, especially ofloxacin. Also the enzyme encoded by the bacterial ipuC gene (a gamma-glutamylamides, sprthase) is used for synthesis of gamma-glutamylamides, specifically theanine. Inactivation of the ipuH and I genes were inactivated produced (II) at 8 mm after 60 hour culture. For a shinlar strain in which only the ipuI had been inactivated the maximum (II) concentration was about 7 mM, after 6 hour, falling to Practically zero after about 20 hour. This sequence represents the Pseudomonas putida KIEI/I-BII IpuC protein products (potential glutamine synthetase) which is described in the method of the invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AGGGYEISSVDTGYSDCHLCADLNSLHLLPWSEGAVLAISNPHNFVTSEPLFCSPRVILM 123
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 ofloxacin, has the ipuH and
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                                                                                                                                                                                                                                                                                                                                                                                                 25.9%; Score 614.5; DB 22; ilarity 34.8%; Pred. No. 5e-51; Conservative 73; Mismatches 194;
as pharmaceutical intermediate especially genes for alaninol catabolism inactivated
                                                      German.
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                                                    Example 1; Page 93-94; 106pp;
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Matches 159; Conserv
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This invention describes novel microorganisms (A), or their enzymatic extracts, able to convert isopropylamine (I) to L-alaninol (II) and which have the liptH and ipul genes, encoding enzymes involved in metabolism of (II), inactivated. (II) is an intermediate for pharmaceuticals, especially ofloxacin. Also the enzyme encoded by the bacterial ipuc gene (a gamma-qlutamylamides ynthase) is used for synthesis of gamma-glutamylamides specifically theanine. Inactivation of the ipuH and I genes improves production of (II). Typically, a Pseudomonas in which both ipuH and I genes were inactivated produced (II) at 8 mM after 60 hour culture. For a similar strain in which only the ipul had been inactivated the maximum (II) concentration was about 7 mM, after 6 hour, falling to practically zero after about 20 hour. This sequence represents the peudomonas putida. IpuC encoded protein described in the method of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                71 --DGLEFTGWDSGYPDIALIPDLSTLSLVPWQEKTASVLCDIQH-LNGEPLNLSPRNLLR 127
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                                                                                                                                                                                                                                                                                                                               New microorganism for converting isopropylamine to L-alaninol, useful as pharmaceutical intermediate especially ofloxacin, has the ipuH and genes for alaninol catabolism inactivated
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Note: The sequence data for this patent directly from WIPO specification, but was obtained in electronic format directly from WIPO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequences AAU39105-AAU68017 represent Propionibacterium acnes immunogenic
                                                                                                                                                                                                                                                                                                                                                                                                                                               SAPHO syndrome; synovitis; acne; pustulosis; hypertosis; osteomyelitis; uveitis; endophthalmitis; bone; joint; central nervous system; ELISA; inflammatory lesion; acne vulgaris; enzyme linked immunosorbent assay; dermatological; osteopathic; neuroprotectant.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Propionibacterium acnes polypeptides and nucleic acids useful for vaccinating against and diagnosing infections, especially useful for treating acne vulgaris.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Bhatia A;
Propionibacterium acnes immunogenic protein #15727
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Jen S, Carter D;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Example 1; SEQ ID No 16026; 1069pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ftp.wipo.int/pub/published_pct_sequences
                                                                                                                                                                                         AAU54831 standard; Protein; 472 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       21-APR-2000; 2000US-199047P.
02-JUN-2000; 2000US-208841P.
07-JUL-2000; 2000US-216747P.
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L'maisonneuve J, Zhang Y,
                                                                                                                                                                                                                                                                                                                        (first entry)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WO200181581-A2
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      The present invention describes a coryneform bacterium (I) which has L-glutamine producing ability and has been modified so that its intracellular glutamine synthetase activity should be enhanced. Also described is a DNA (II) coding for epictein having glutamine synthetase activity or glutamine synthetase adenylyl transferase activity (see ABP53500 and ABP53501 respectively). (I) Is useful for producing
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Brevibacterium lactofermentum; glnA2; glnE; L-glutamine; fermentation; coryneform bacterium; glutamine synthetase adenylyl transferase; glutamine synthetase; liver function promoting agent; enzyme; seasoning.
                                                                         GESPVALDNGGYFDHTTLGAGTDFRRDAINVLEQMGISVEFSHHEAAPGQHEIDLRYADA
                                                                                                                                                                                                           -- I SNPHNFVTSEPLFCSPRVILMQQIERLANLKLKGLFASELEFNLFNETYKSASQKHW
                                                                                                                     160 KNLKTAOPHHOWMNISASSGIETFWRSVRNKLEEAGILMEATHPEFLPSQHELNFVPADP
                                                                                                                                                                                       LTMADRHI I AKHGVREMAEQSGMVATFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQN
                                                                                                                                                                                                                                                            DEYGMSTLARNWIAGLLKYVPEATYFFASYINSYKRLOPLTFAPTKCCWAIDNRTSAFRL
                                                                                                                                                                                                                                                                                                                                --- CNSKSEGINVELRIGGADLNPYLAFSAIIAAGISGIEEKLELPPPASGNVY--NDKE
                                                                                                                                                                                                                                                                                                                                                                                                     ----LPEFPNSLONATHLLKESKMLNKTFGEKLILHYVNAANVEINEFSKOVTDWELNO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Coryneform bacterium which has L-glutamine producing ability and has been modified so that its intracellular glutamine synthetase activity should be enhanced, useful for producing L-glutamine
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Brevibacterium lactofermentum glnA2 protein SEQ ID NO:2.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (AJIN ) AJINOMOTO CO INC.
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Kurahashi O;
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L-glutamine, by culturing a bacterium in a medium to produce and accumulate L-glutamine in the medium and collecting the L-glutamine. L-glutamine produced by (1) is useful industrially as an ingredient of seasonings, as liver function promoting agents, in amino acid transfusions, and in comprehensive amino acid preparation. (II) is useful for breeding (I). The by-production of L-glutamic acid is suppressed and the production efficiency of L-glutamine is improved using (II). The present sequence represents Brevibacterium lactofermentum glnA2, which has glutamine synthetase activity.
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                                                                                                                                                                                                                                                                                                                                                                                                                                             361
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LAFSVMLGAGLKGIKEGYELDEPAEDDISNLSFRERRAMGYND----LPNSLDQALRQM 402
                                                                                                                                                                                                                                                                       121
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                                                                                                                                                                                                 GKIDTVVLACVDMQGRLMGKRLTGRHFLGLDQKKISISTFVYAVTIEGIAGGGYEISSVD
                                                                                                                                                                                                               TGYSDCHLCADLNSLHLLPWSEG-AVLAISNPHNFVT---SEPLFCSPRVILMOQIERLA
                                                                                                                                                                                                                                                               | : :|; | : | | : | | T----IARPDPSTFQVLPLEAGISKLQARLFCDVTMPDGQPSFSDPRQVLRRQVQLAA
                                                                                                                                                                                                                                                                                               NLKLKGLFASELEFNLFNETYKSASQKHWKNLKT-----AQPHHQWMNISASSGIETFM
                                                                                                                                                                                                                                                                                                                     DEGLICMISPEIEFYLV-------OSLRINGLPPVPIDNGGYFDQAIFNEAPNFR
                                                                                                                                                                                                                                                                                                                                                              TFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLARNWIAGLLKYVPEATY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -----YNDKELPEFPNSLQNATHLL
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                                                                                                                                                                                                                                                                                                                                                                                                                                            FFASYINSYKRLQPLTFAPTKCCWAIDNRTSAFRLCN---SKSEGINVELRIGGADLNPY
                                                                                                                                                                          Gaps
                                                                                                                                                                        71;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            amino acid synthesis; vitamin; saccharide;
                                                                                                                                                20.0%; Score 475.5; DB 23; Length 446; 29.2%; Pred. No. 2e-37; ive 83; Mismatches 174; Indels 71;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KESKMLNKTFGEKLILHYVNAANVEINEFSKOVTDWELNOGFN
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    glutamicum protein fragment SEQ ID NO: 5942
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2000JP-0159162.
2000JP-0280988.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Corynebacterium glutamicum.
                                                                                                                                                            Best Local Similarity 29.2
Matches 135; Conservative
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                                                                                                                          446 AA;
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07-APR-2000;
03-AUG-2000;
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sequences from the Coryneform bacterium Corynebacterium glutamicum. These are useful for identifying the mutation point of a gene derived from a mutath of coryneform bacterium, corynebacterium glutamicum. These analysing the expression profile or expression partiern of a gene derived from coryneform bacterium, and identifying a homologue of a gene derived from coryneform bacterium. Coryneform bacterium. Coryneform bacterium coryneform bacterium coryneform bacterium producing amino acids, nucleic acids, vitamins, saccharides and organic acids, particularly 1-1ysine. The present sequence is a protein described in the examplification of the invention.

Note: The sequence data for this patent did not form part of the printed specification, but was obtained in electronic format directly from the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  131 NLKLKGLFASELEFNLFNETYKSASQKHWKNLKT-----AQPHHQWMNISASSGIETFM 184
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              288 VINOWVNSYKRIVYGNEAPTAATWGVSNRSALVRVPTYRLNKEESRRVEVRLPDTACNPY 347
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          75 TGYSDCHLCADLNSLHLLPWSEG-AVLAISNPHNFVT---SEPLFCSPRVILMOQIERLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GKIDTVVLACVDMQGRLMGKRLTGRHFLGLDQKKISISTFVYAVTIEGIAGGGYEISSVD
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                                                                                                                                                                                                                                                                                                                                                                                                      The present invention provides a number of nucleotide and protein
                                                  Yokoi
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                                                                                                                                                                                                                                                                                                                                                Claim 17; SEQ ID NO: 5942; 246pp + Sequence Listing; English
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Pred. No. 6.1e-37;
4; Mismatches 174; Indels
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                                               Ochiai
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                                               S, Hayashi
Ozaki A;
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                                                  H, Ando
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KYOW ) KYOWA HAKKO KOGYO KK
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                                                  Mizoguchi
Senoh A,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                European Patent Office
                                                                                                                                 2001-376931/40.
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Best Local Similarity
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                                                                                                                              WPI; 2001-376931,
N-PSDB; AAH67407
                                                  o, z
                                                  Nakagawa
Tateishi
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LAFSAIIAAGISGIEEKLELPPPASGNV------YNDKELPEFPNSLQNATHLL 409
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        245 TFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLARNWIAGLLKYVPEATY 304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        305 FFASYINSYKRLOPLTFAPTKCCWAIDNRTSAFRLCN---SKSEGINVELRIGGADLNPY 361
                                                                                                                                                                                                                                                                                                                         AAF71753 to AAF72330 encode the Corynebacterium glutamicum metabolic pathway (MP) proteins given in AAB79634 to AAB80211. The C. glutamicum MP nucleic acids are useful for the production of fine chemicals in microorganisms, including organic acids, nonproteinogenic amino acids, purine and pyrimidine bases, nucleosides, nucleotides, lipids, saturated and unsaturated fatty acids, diols, carbohydrates, aromatic compounds, vitamins, cofactors, polyketides and enzymes.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              29 GHIKSVVVVAPAELESAL-----EEGIGFD------GSAIEGYA----RISEAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SFMPKPPQEHAGSANHTHMSLFEGDT--NAFHDPDDSYMLSKTAKQFIAGILHHAPEFTA
                                                                                                                                                                                                            Nucleic acids from Corynebacterium glutamicum encoding metabolic pathway proteins, useful for producing fine chemicals in microorganisms, including organic acids, nonproteinogenic amino acids, and purine and pyrimidine bases -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GKIDTVVLACVDMQGRLMGKRLTGRHFLGLDQKKISISTFVYAVTIEGIAGGGYEISSVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TGYSDCHLCADLNSLHLLPWSEG-AVLAISNPHNFVT---SEPLFCSPRVILMQQIERLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DEGLICMISPRIEFYLV-------OSLRINGLPPVPTDNGGYFDQATFNEAPNFR
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 446;
                                                                                                                                Haberhauer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           19.8%; Score 470.5; DB 22; Length 28.9%; Pred. No. 6.1e-37; Live 84; Mismatches 174; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  410, KESKMLNKTFGEKLILHYVNAANVEINEFSKOVTDWELNOGFN
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                                                                                                                                Zelder
                                                                                                                                                                                                                                                                                            Claim 20; Page 300-301; 1737pp; English.
                                                                                                                               Schroeder H,
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                03-SEP-1999; 99DE-1042095.
03-SEP-1999; 99DE-1042124.
03-SEP-1999; 99DE-1042129.
09-MAR-2000; 2000US-0187970.
   99DE-1042088
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                                                                                                                               Kroeger B,
                                                                                                                                                               WPI; 2001-137957/14.
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                                                                                              (BADI ) BASF AG.
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                                                                                                                               Pompejus M,
   03-SEP-1999;
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Matches 134;
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                                                                                              Corynebacterium glutamicum; metabolic pathway protein; MP protein; fine chemical production; microorganiam; organic acid; nucleoside; nomproteinogenic amino acid; purine base; pyrimidine base; nucleotide; lipid; saturated fatty acid; unsaturated fatty acid; diol; vitamin;
                                                                                                                                                             carbohydrate; aromatic compound; cofactor; polyketide; enzyme
                                                              Corynebacterium glutamicum MP protein sequence SEQ ID NO:96.
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99DE-1032206.
99DE-1032227.
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99DE-1031634
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99DE-1042087
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                                                                                                                                                                                          Corynebacterium glutamicum
                                (first entry)
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                                30-APR-2001
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         103
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PLFCSPRVILMQQIERLANLKLKGL-FASELEFNLF--NETYKSASQKHWKNLKTAQPHH 169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KLVVKTIARKHGLHATFMAKPVHGINGSGMHCNMSL-FTEDGANAFADPTGDMGLSDVAH 274
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                                                                                                                                                                                                                                                                                                                                                                                                                                                   늉
                                                                                                                                                                                                                                                                                                                                                                                                            The present invention is related to a Lactococcus lactis nucleotide sequence (ABA90521) and related proteins (ABB53100-ABB55621). The nucleic acid sequence; is useful in the detection and/or amplification of nucleic acid sequence, particularly to identify Lactococcus lactis or related species. The proteins of the invention are useful for the biosynthesis or biodegradation of a composition of interest. The invention helps research in lactic bacteria, particularly useful in the production of yogurt and cheese.

Note: The sequence data for this patent is based on equivalent patent WO200177334 (published 18-OCT-2001) which is available in electronic format directly from WIPO at ftp.wipo.int/pub/published_pct_sequences.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1 MILIYDELNNLIRNGKIDTVVLACVDMQGRLMGKRL--TGRHFLGLDQKKISISTFVYAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QWMNISASSGIETFMRSVRNKLEEAGILMEATHPEFLPSQHELNFVPADPLTMADRHIIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ELRIGGADLNPYLAFSAIIAAGISGIEEKLELPPPASGNVY--NDKE----LPEFPNSL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MIITAADIRRDVKEKDIKFLRLMFTDILGTLKNVEVPATDEQLDKLFENKMMFD----GS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KHGVREMAEQSGMVATFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SFIAGLLKHAYNFTAITNPTVNSYKRLVPGYEAPVYVAWAGRNRSPLIRVPASRGLSTRV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PFAGDPRGVLKRNLKSMEKLGFKSFNLGPEPEFFLFKLNENDEPTLEVNDKG------
                                                                                                                                                                                                                                                                                                                              New nucleotide sequence useful in the identification or Lactococcus lactis and related species {	extstyle -}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 44;
                                                            bacterium; yogurt; cheese.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 23; Length 446;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   19.5%; Score 464; DB 23; 29.0%; Pred. No. 2.7e-36; iive 80; Mismatches 211;
                                                                                                                                                                                                                                                                              Ehrlich SD
                                                                                                                                                                                                                                                                                                                                                                                      Claim 6; SEQ ID No 2257; 2504pp; French.
                                                                                                                                                                                                                                                (INRG ) INRA INST NAT RECH AGRONOMIQUE.
                                                           Biosynthesis; biodegradation; lactic
                                                                                                                                                                                                                                                                              Renault P,
                              Lactococcus lactis protein glnA
                                                                                                                                                                                   11-APR-2000; 2000FR-0004630.
                                                                                                                                                                                                                11-APR-2000; 2000FR-0004630.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local Similarity 29.0*
Matches 137; Conservative
(first entry)
                                                                                         Lactococcus lactis IL1403
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                                                                                                                                                                                                                                                                            Sorokine
                                                                                                                                                                                                                                                                                                         WPI; 2002-043418/06.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      446 AA;
                                                                                                                    FR2807446-A1.
16-MAY-2002
                                                                                                                                                    12-OCT-2001
                                                                                                                                                                                                                                                                            Bolotine A,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             23
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The present invention describes a polynucleotide (I) comprising a sequence of a Bifidobacterium genome selected from the nucleotide sequence given in ABQB1842 and ABQB1843, or a sequence exhibiting at least 90% identity or which hybridises with the sequence given in ABQB1843. Also described is a polynucleotide (II) encoding a fusion protein, comprising a sequence selected from 1097 sequences given in ABP65258 to ABP66154 ligated in frame to a polynucleotide concoling a heterologous polypepide. (I) has antidiarrheic and antibacterial activities, and can be used as an inhibitor of Salmonella. (I) (which is a probe) is useful for the detection and/or identification of Bifidobacterium longum in a biological sample. A carrier containing the lactic acid bacterium Bifidobacterium longum NCC2705 (CNCM I-2618) can be used for preventing and/or treating diarrhoes brought about by pathogenic bacteria and/or rotavirus. The carrier is a food composition selected from milk, yogurt, curd, cheese, fermented milks, milk based fermented products, incertemans, fermented cereal based products, in a selected from tablets, liquid bacterial suspensions, dried oral cappenent, wet oral supplement, dry tube feeding or wet tube feeding. (I) is useful in DNA arrays or chips to carry out analysis of the expression of the Bifidobacterium gene. ABQ81884 to ABQ81850 represent in the sequence of sequences given in the Sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or sequence or s
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Listing from the present invention but not mentioned further within the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Novel polynucleotide comprising Bifidobacterium genome sequence useful as a probe or primer for detecting and/or identifying Bifidobacterium longum in a biological sample
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Bifidobacterium longum NCC2705; Bifidobacterium; bacterial; antibacterial; inhibitor of Salmonalla; detection; identification; lactic acid bacterium; diarrhoea; pathogenic bacteria; rotavirus; food composition; pharmaceutical composition.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Bifidobacterium longum NCC2705 ORF amino acid sequence SEQ ID NO:783
                                                                                               446
454
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                                                  395 HNAVXALPEDTIVTEALGEHVLVNFVEAKRIEWASYAQFVSQWEIDNYLELY
ONATHLLKESKMLNKTFGEKLILHYVNAANVEINEFSKOVTDWELNOGFNRY
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; Pred. No. 3.2e-35;
75; Mismatches 167;
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                                                                                                                                                                                                                                                                                                                                            ABP66039 standard; Protein; 445
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  19.1%;
31.1%;
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Best Local Similarity 31.1<sup>1</sup>
Matches 127; Conservative
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Streptococcus, GAS; GBS; group B streptococcus; Streptococcus agalactiae; group A streptococcus; Streptococcus pyogenes; antibacterial; antiinflammatory; infection; vaccine; meningitis; gene therapy.
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                                 114
                                                                                                                                                     FCSPRVILMQQIERLANLKLKGL---FASELEFNLFNETYKSASQKHWKNLKTAQPHHQW 171
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TVVKEISLERGIHASFMPKPLADAPGSGMHTHLSL--FEGDSNAFYEAGGEFNMSLTARO
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24-NOV-2000; 2000GB-0028727.
07-MAR-2001; 2001GB-0005640.
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CC the specification. The proteins have antibacterial and antiinflammatory activity. (1), nucleic acids encoding (1), ABN66044-ABN71526 and activity. (1), nucleic acids encoding (1), ABN66044-ABN71526 and antibodies that bind (1) are used in the manufacture of medicaments for the treatment or prevention of infection or disease caused by Streptonoccus bacteria, particularly S. agalactiae and S. pyrogenes.

CN acid acids encoding (1) are used to detect Streptococcus in a biological sample. (1) is used to determine whether a compound binds to complete a vaccine or diagnostic composition. The disease caused by Streptococcus that is prevented or treated may be meningitis. Nucleic cused as a vaccine or diagnostic composition. The disease caused by Streptococcus that is prevented or treated may be meningitis. Nucleic acid encoding (1) may be used to recombinantly produce (1) and may be used in gene therapy. Antibodies to (1) are used for affinity chromatography, immunoassays, and distinguishing/identifying
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1 MTITAEDIRREVKEKNVTFLRLMFTDILGVMKNVEIP----ATDEQLDKVLSNKAMFDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     116 CSPRVILMQQIERLANLKLKGL-FASELEFNLFNETYKSASQKHWKNLKTAQPHHQWMNI
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               226 HIIAKHGVREMAEQSGMVATFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDBYGM-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     54;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DB 23; Length 448;
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18.7%; Score 445; DB 23; Length 4.
Best Local Similarity 27.4%; Pred. No. 2e-34;
Matches 131; Conservative 80; Mismatches 213; Indels
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        448 AA;
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02-MAY-2002

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The invention relates to antisense inhibitors of genes essential to prokaryotic cellular proliferation, their use in identifying the genes, their use in the discovery of novel antibiotics, the essential genes themselves and the discovery of novel antibiotics, the sesential genes themselves and the discovery of novel antibiotics, the sesential genes themselves and the encoded proteins. The prokaryotes used are benemoniae, pseudomonas aeruginosa and Enterococcus faccalis. The invention is also useful for the identification of potential new targets for antibiotic development. The antisense nucleic acids can also be used to identify proteins used in proliferation, to expressed proteins. The proteins can be used to screen compounds in rational drug discovery programmes. The antisense nucleic acid sequence is also useful to screen for homologous nucleic acids which are required for cell proliferation in sesential prokaryotic cellular proliferation protein.

Note: The sequence data for this patent did not form part
RLELRSVDPTANPYLALAVLLEAGLDGIINKIEAPEPVEANIYTMTMEERNEAGIIDLPS 394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Carr
                                                            SLONATHLLKESKMLNKTFGEKLILHYVNAANVEINEFSKOVTDWELNOGFNRY
                                                                                             늉
                                                                                                                                                                                                                                                                                                                                                                                                                                          Streptococcus pneumoniae cellular proliferation protein #214.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 448;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Trawick JD,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             New polynucleotides for the identification and development antibiotics, comprise sequences of antisense nucleic acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Antisense, prokaryotic cellular proliferation protein; antibiotic; antibacterial; drug design.
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Pred. No. 3.7e-33;
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Xu HH;
                                                                                                                                                                                                                                                                AAU37785 standard; Protein; 448 AA.
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23-MAY-2000; 2000US-20684BP.
26-MAY-2000; 2000US-207727P.
23-OCT-2000; 2000US-242578P.
27-NOV-2000; 2000US-255625P.
22-DEC-2000; 2000US-253625P.
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                                                                                                                                                                                                                                                                                                                                                                                   (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Streptococcus pneumoniae.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (ELIT-) ELITRA PHARM INC
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Best Local Similarity
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Yamamoto RT,
                                                                                                                                                                                                                                                                                                                                                                                   14-FEB-2002
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                                                                                                               셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   The invention relates to a protein (ABP25413-ABP30895) from group B streptococcus/GBS (Streptococcus agalactiae) or group A streptococcus/GBS (Streptococcus pyogenes), comprising one of 5491 sequences (S1), given in the specification. The proteins have antibacterial and antiinflammatory activity. (I), nucleic acids encoding (I), ABN6604-ABN71526 and the treatment or prevention of infection or disease caused by Streptococcus bacteria, particularly S. agalactiae and S. pyrogenes. Nucleic acids encoding (I) are used to detect Streptococcus in a streptococcus bacteria, particularly S. agalactiae and S. pyrogenes. Nucleic acids encoding (I) are used to detect Streptococcus in a streptococcus that is prevented or nucleic acid encoding (I). A composition comprising (I) or a nucleic acid encoding (I), may be used to recombinantly produce (I) and may be used in gene therapy. Antibodies to (I) are used for affinity changes of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the composition of the compositio
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      108 DPRGNLKRALKHMNEIGYKSFNLGPEFFFFFKMDDKGNPTLE------VNDNG 155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    170 QWWNISASSGIETFWRSVRNKLEEAGILMEATHPEFLPSQHELNFVPADPLTWADRHIIA 229
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   New Streptococcus protein for the treatment or prevention of infectic or disease caused by Streptococcus bacteria, such as meningitis, and for detecting a compound that binds to the protein -
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                                                                                                                                                                                                                                                                                                                             Fraser
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Best Local Similarity 27.4%; Pred. No. 4.8e-34;
Matches 130; Conservative 82; Mismatches 216; Indels 4
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                                                            29-OCT-2001; 2001WO-GB04789.
                                                                                                               27-OCT-2000; 2000GB-0026333.
24-NOV-2000; 2000GB-0028727.
07-MAR-2001; 2001GB-0005640.
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N-PSDB; ABN68494.
                                                                                                                                                                                                                                     CHIR-) CHIRON SPA
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                                                                                                                                                                                                                                                                                                                                   VREMAEQSGMVATFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGM--STLARN 290
                                                                                                                                                                                                                                                                                                                                                                     277
                                                                                                                                                                                                                                                                                                                                                                                                                                              337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LRIGGADLNPYLAFSAIIAAGISGIEEKLELPPPASGNVY-----NDKELPEFPNSLQ 403
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Hanniffy SB;
                                                                                                                                                                                                           GPPRGNLKRALRHMEEVGFKSFNLGPEPEFFLFKLDENGDPTLEVNDKG-------GYF
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                                                           58 VTIEGIAGGGYEISSVDTGYSDCHLCADLNSLHLLPWSE--GAVLAISNPHNFVTSEPLF
                                                                                                                                                                                  116 CSPRVILMQQIERLANLKLKGL-FASELEFNLF--NETYKSASQKHWKNLKTAQPHHQWM
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 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           therapy;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          New Streptococcus pneumoniae protein or polypeptide, useful as an immunogen and/or antigen for use in vaccines against Streptococcus pneumoniae infection, and in diagnostic assays
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 40;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NATHLLKESKMLNKTFGEKLILHYVNAANVEINEFSKQVTDWELNQGFNRY
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 Indels
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220;
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Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note= "Encoded by GTTC"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Streptococcus pneumoniae ID-216 protein.
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83;
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Conservative
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                                                                   protein
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                                                                relates to Streptococcus pneumoniae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Match 18.2%; Score 432; DB 24; Local Similarity 27.2%; Pred. No. 3.7e-33; Les 128; Conservative 83; Mismatches 220;
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Claim 7; Page 38; 43pp; English.
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159 DLAPTDLADNTRREIVNVLTKMGFEVEASHHEVAVGQHEIDFKYDEVLRACDKIQIFKLV 218
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            The invention relates to a protein comprising or having at least 50% identity to any of the 2469 amino acid sequences, identified in the specification (available on a computer readable formath, or its fragment, expressed from 2469 of 2489 identified blax coding regions from the expressed from 2469 of 2489 identified blax coding regions from the expressed from 2469 of 2489 identified blax coding regions from the expressed from 2469 of 2489 identified blax coding regions from the expressed from 2469 of 2489 identified blax coding regions from the Experiment of the composition) a kit comprising the protein, DNA or antibody (in a composition) a kit comprising first and second primers, which are the nucleic acid cited above or fragments between nucleotides 8 -100 of a sequence not defined in the specification, for amplifying a target sequence contained within a Streptococcus nucleic acid sequence, where the first primer is substantially complementary to the target sequence, and where the parts of the primers having substantial complementarity define the termin of the target compound with the protein, and determining whether the test compound binds to the protein and a Streptococcus pneumoniae bacterium, where one or more considered modecules, antibody and compositions are useful as medicaments for treating or preventing a disease or infection due to streptococcus bacteria, particularly S. pneumoniae, such as pneumonia, sepsis, otitis media or ear infection. They are also useful in developing vaccines, diagnostics and antibioties. The methods are useful for the constant of dentifying immunodominant proteins. The present sequence if and all dentifying immunodominant proteins. The present sequence if and a dentifying immunodominant proteins. The present sequence if and all dentifying immunodominant proteins. The present sequence if and a dentifying immunodominant proteins. The present sequence if and a dentifying immunodominant proteins. The present sequence if and a dentifying immunodominant proteins.
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                                                                                                                                                                                                                                                                                                                                               New proteins and nucleic acid molecules from Streptococcus pneumoniae, useful as medicaments for treating or preventing a disease or infection due to streptococcus bacteria, such as pneumonia, sepsis, otitis media or az infection -
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Claim 1; SEQ ID No 866; 56pp; English.
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                                                       27-MAR-2002; 2002WO-IB02163
                                                                                                       27-MAR-2001; 2001GB-0007658
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Matches 128; Conservative
                                                                                                                                                    (CHIR-) CHIRON SPA.
(GENO-) INST GENOMIC RES.
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N-PSDB; ABX06145.
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          03-OCT-2002
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233 VREMAEQSGMVATFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGM--STLARN 290
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               The invention relates to antisense inhibitors of genes essential to prokaryotic cellular proliferation, their use in identifying the genes, their use in the discovery of novel antibitotics, the essential genes themselves and the encoded proteins. The prokaryotes used are Bscherichia coli, Staphylococcus aureus, Salmonella typhi, Klebsiella pneumoniae, Pseudomonas aeruginosa and Enterococcus faecalis. The invention is also useful for the identification of potential new targets for antibiotic development. The antisense nucleic acids can also be used to identify proteins used in proliferation, to express these proteins, and to obtain antibodies capable of binding to the expressed proteins. The programmes can be used to screen compounds in rational drug discovery programmes. The antisense nucleic acid sequence is also useful to screen
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N-PSDB; AAS52096.
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26-MAY-2000;
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Yamamoto RT,
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22-DEC-2000; 2000US-257931P.
16-FEB-2001; 2001US-269308P.
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for homologous nucleic acids which are required for cell proliferation in a wide variety of organisms. The present sequence represents an essential prokaryotic cellular proliferation protein.

Note: The sequence data for this patent did not form part of the printed specification, but was obtained in electronic format directly from WIPO at format directly from WIPO at
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92; Mismatches 211; Indels
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26-MAY-2000; 2000US-207727P.
23-GCT-2000; 2000US-24578P.
27-NOV-2000; 2000US-253625P.
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The invention relates to antisense inhibitors of genes essential to prokaryotic cellular proliferation, their use in identifying the genes, their use in their discovery of novel antibiotics, the essential genes themselves and the encoded proteins. The prokaryotes used are Escherichia coli, Staphylococcus aureus, Salmonella typhi, Klebsiella consequence augustantia, Baedanisa, Baedanisa, Baedanisa, The Escherichia coli, Staphylococcus aureus, Salmonella typhi, Klebsiella con multipori a also useful for the identification of potential new targets for antibiotic development. The antisense nucleic acids can also be used to identify proteins used in proliferation, to express these proteins, and to obtain antibodies capable of binding to the expressed proteins. The proteins can be used to screen compounds in rational drug discovery con programmes. The antisense nucleic acid sequence is also useful to screen for homologous nucleic acids which are required for cell proliferation in a wide variety of organisms. The present sequence represents an essential prokaryotic cellular proliferation protein.

Note: The sequence data for this patent did not form part

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                                                                                                                               Trawick JD,
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                                                                                                                               Zyskind JW,
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                                                                                                                        Ohlsen KL,
Xu HH;
(ELIT-) ELITRA PHARM INC
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Search completed: December 17, 2003, 22:42:57 Job time : 43 secs

us-10-098-602a-2.rag

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A Holygna Apoosoos Mesorhizo
                                                                                                                                                                      Pred: No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
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PSP311159
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BX248344
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AE004630
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em_htgo_mus:*
em_htgo_other:*
                                    other:
                                                             em htg pln:*
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            em_htg_hum:*
em_htg_inv:*
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                                                em_htg_mus:
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Query
Match Length DB
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40.8 11725
40.0 12340
39.7 10069
39.7 10069
33.6 14715
33.6 14715
33.6 29850
25.9 11355
25.9 11355
25.0 128136
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                                                                                                                                                       1 MTITYDELNNLIRNGKIDTV.....INEFSKQVTDWELNQGFNRY 454
       GenCore version 5.1.6
(c) 1993 - 2003 Compugen Ltd.
                                                         nucleic search, using frame_plus_p2n model
                                                                                                                                                                                                                                                          2888711 seqs, 20454813386 residues
                                                                                                                                                                                                                                                                                Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                             Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                          Xgapop 10.0 , Xgapext
Ygapop 10.0 , Ygapext
Fgapop 6.0 , Fgapext
Delop 6.0 , Delext
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Maximum DB seq length: 200000000
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Perfect score:
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                                                                                 Run on:
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Sinorhizo

AL591790

AE009691

Description

AE009164 Agrobacte AE008130 Agrobacte AL008883 Mycobacte AE007117 Mycobacte

Mycobacte Streptomy

BX248344 R

Streptomy

AX259711

Pseudomon

Streptomy

AF440524 AP005021 AP001520 I

Pseudomon

AE016862

Highly th Thermotog

AE016790 B BD180047 P AE004758 B

Corynebac

Corynebac

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AX122526 8 BD164643 1 AX063813 8 AJ310086 0

Seguence Sequence Sequence

AX503498

T.maritima

X60160

AE001758

AP005281 Corynebac AX127150 Sequence M18966 Clostridium

Pseudomon

Brucella Brucella

AE016794 B AE009688 B AE014571 E

Pseudomon

AE016875 AE001904 A

Pseudomor

AC004396 1 AE004467 1 AE004630 1

Sequence

AE012342 7 AE016793 1 AX492786

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ADTILTISISERELGARNIRVNIVAGSTHTEWTEGWVGTDFGNMLIAGVPLGQRFGKP
DDIAPTVAFLASDERAWLTGERINASGGAR"
345783 bp DNA linear BCT 15-MAY-2001
Mesorhizobium loti DNA, complete genome, section 8/21.
AP003001 BA000012.
AP003001.2 GI:14023393
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DNA Res. 7 (6), 331-338 (2000)
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Mesorhizobium loti
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Phyllobacteriaceae, Mesorhizobium.
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994. .1740
/gene="mlr3013"
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                                TCCGCGCATGACGAAACGCATGGCTGCAACTATCTGCTGGCCGCCGACAACTGATGGAG
                                                                                                                                  LeuAspGlnLysLysIleSerIleSerThrPheValTyrAlaValThrIleGluGlyIle
                                                                                                  AlaGlyGlyGlyTyrGluIleSerSerValAspThrGlyTyrSerAspCysHisLeuCys
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             AWABELTADGHISVICIDERGEPEKGSTPATTALVQFEIDQPLGTLSKAIGKAZOGAN
SKERLAISULAGRIEDLAIDCRLERFESLYLAGTLIGPAEMEDEAERROGAGVATYL
TPQPLAGTFGIDRGAILSHONIALDPRKLTAGLILKALERKALYAPAEATATEDSA
GEAVVATKOGPTITARHVVLATGYELVOIVPAAAHRIISTWALATCPOQPRKLWGEPSF
REASDPYLTURATADCRVICCGEDEDFADETRRDELIADKSARIADKLGRLFPYLDV
TREFAMTGSFGTTSAGLPYIGAVPGHPRIHAVWGYGGNGITFSRIASEIISASIKGSA
DTDAELLRAFNR"
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AKDDAIJAISKSKEGRLIVTGVGKSGHIGSKIAATLASTGTBAFFVHFVEANHGDLGAT
AKDDAIJAISWSGESKEMLGIVAYSRRFSIPLIAVTSGETSALARAADVVLLLPRTPE
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VGPGMPLAVLGTKMPEAVMTLSQKKVGCVLIVDANGELAGIITDGDVARNLHRNLADV
IVDEVMTRTPFKTVDPQTLAGTAIALINEHNIGALVVTRNNMPLGVVHFHDLLRIGAR
11830. .13626
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VERKENDEPANLIESMGROYTAERNKRAQILAAGGIKOSQILEAEGRKEAAFRDAEA
RERSAEARAATOVVSEAISKGDVOALNY FVAOKYTEALGKIGTATNSKIVLMPFEAS
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                                                                                                                                                                                                                                                                                                                                                                                                                                        /translation="mdf8gfp1a1galallulull1kg1rt1pqgynytverfgrytk
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                'trans] table=11
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ThrTyrAspGluLeuAsnAsnLeuIleArgAsnGlyLysIleAspThrValValLeuAla
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Matches:
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codon start=1
trans1_table=11
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11830. .13626
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/gene="mlr3021"
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Pred. No.:
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/locus_tag="BRA0731"
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                                                                                                              family protein"
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                                                                                                                                                                                                 AE014569 11725 bp DNA linear BCT 02-OCT-2002
Brucella suis 1330 chromosome II section 65 of 108 of the complete
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                                                                                                                                                      443
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Paulsen, J. Sebhadri, R., Nelson, K.E., Eisen, J.A., Heidelberg, J.F.,
Read, T.D., Dodson, R.J., Umayam, L.A., Brinkac, L.M., Beanan, M.J.,
Daugherty, S.C., Deboy, R., Durkin, A.S., Kolonay, J.F., Madupu, R.,
Nelson, W.C., Ayodeji, B., Kraui, M., Shetty, J., Malek, J.A., Van
Karn, S.E., Riedmuller, S., Tettelin, H., Gill, S., White, O.,
Salzberg, S.L., Hoover, D.L., Lindler, L., Halling, S.M., Boyle, S.M.
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Paulsen, J., Seshadri, R., Nelson, K.E., Eisen, J.A., Heidelberg, J.F., Read, T.D., Dodson, R.J., Unayam, L.A., Brinkac, L.M., Beanan, M.J., Daugherty, S.C., Deboy, R., Durkin, A.S., Kolonay, J.F., Madupu, R., Nelson, W.C., Ayodeji, B., Kraul, M., Shetty, J., Malek, J.A., Van Karn, S.E., Riedmuller, S., Tettelin, H., Gill, S., White, O., and Praser, S.L., Hoover, D.L., Lindler, L., Halling, S.M., Boyle, S.M.
404 AsnAlaThrHisLeuLeuLysGluSerLysMetLeuAsnLysThrPheGlyGluLysLeu 423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           The Brucellasuis genome reveals fundamental similarities between animal and plant pathogens and symbionts
Proc. Natl. Acad. Sci. U.S.A. 99 (20), 13148-13153 (2002)
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Submitted (14-AUG-2002) The Institute for Genomic Research, 9712
Medical Center Dr., Rockville, MD 20850, USA
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement (746. .1975)
/locus tag="BRA0729"
complement (746. .1975)
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TIGR protein family HMM
                                                                                                                                                  424 IleLeuHisTyrValAsnAlaAlaAsnValGluIleAsnGluPheSerLysGlnValThr
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Brucella suis 1330
Bacteria; Proteobacteria; Alphaproteobacteria; Rhizobiales;
Brucellaceae; Brucella.
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protein_id="AAN33910.1"
db_xref="GI:23464093"
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AE014569.1 GI:23464092
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ORGANISM
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VERSION
KEYWORDS
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REFERENCE
AUTHORS
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JOURNAL
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Complement (2087. .3031)

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'transī table=11
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GluTyrGlyMetSerThrLeuAlaArgAsnTrpIleAlaGlyLeuLeuLysTyrValPro 300
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                                                                                                                                                                                       23 AlaCysValAspMetGlnGlyArgLeuMetGlyLysArgLeuThrGlyArgHisPheLeu
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                                                                                                                                                                                                                                                                                                                                     63 IleAlaGlyGlyTyrGluIleSerSerValAspThrGlyTyrSerAspCysHisLeu
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                                                                           US-10-098-602A-2 (1-454) x AE014569
   43.61%
     Best Local Similarity:
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AAGOSMIAYALAFLPASFSSLTLLLQPVVAAFLAWTILSEPIGIMQAIGGVIYISGIL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           'translation="MIALITGGIAIGSSPIFVRLSEVGPLATGFWRLALAVLPLLLMD
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similarity; putative"
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locus tag="BRA0736"
note="identified by Glimmer2; putative"
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Matches:
Conservative:
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transl_table=
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transl_table=
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transl_table=
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969.50
61.67%
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Pred. No.:
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Gene name confidence : hypothetical
gradicted by Codon usage
predicted by ReameDay
predicted by FrameDay
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Gene name confidence: hypothetical
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predicted by FrameD"
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1707. .2996

1707. .2996

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/gene="SMc01576"

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Gene name confidence : putative

Gene name confidence : putative

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predicted by Homology

predicted by Homology
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PVTARRALMSRLRSALPRAA"
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/evidence=not
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Laboratoire de Biologie Moleculaire des Relations
Laboratoire de Biologie Moleculaire des Relations
Plantes-Microcyanismes, UMR215-CNS-INRA, BP27, F-31326 Castanet,
France, Laboratoire de Genetique et Developpement UMR661-CNRS,
France, CATC GMBH, Fritz-Arnold-str. 23, D-78467 Konstanz, Germany,
Universitaet Bielefeld, Germany, Unite de Biochimie physiologique,
Universitaet Eielefeld, Germany, Unite de Biochimie physiologique,
Universitaet Catholique de Louvain, Place Croix du Sud 2, Bte 20,
B-1348 Louvain-la-Neuve, Belgium, Unite de Microbiologie, Faculte
des Sciences Agronomiques de Gembloux, Avenue Marechal Juin 6,
B-5030 Gembloux, Belgium, E-mail:Jerome.Gouzy@toulouse.inra.fr
http://sequence.toulouse.inra.fr/meliloti.html.
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Proc. Natl. Acad. Sci. U.S.A. 98 (17), 9877-9882 (2001)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SME591790 323450 bp DNA linear BCT 05-JUL-2002 Sinorhizobium meliloti 1021 complete chromosome; segment 9/12. AL591790 AL591688 AL591790.1 GI:15075230
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Submitted (26-JUL-2001) Gouzy J., Submitted on behalf of the MELILO
                                                                                                                                                                                                                                                                                                                                                                                                                                                           5121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GluLysLeulleLeuHisTyrValAsnAlaAlaAsnValGluIleAsnGluPheSerLys 440
                                                                                                                                                                                                                                                                                                                                                                         381 LeuProProProAlaSerGlyAsnValTyrAsnAspLysGluLeuProGluPheProAsn 400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              420
                                                                                                                                                                                                                                                        5002 TATCTGGCCTTTGCAGCGCTCATCGCCGCCGGCCTGAAAGGCGTGGATGAAAAGCTGGAA
                                           341 AsnSerLysSerGluGlyIleAsnValGluLeuArgIleGlyGlyAlaAspLeuAsnPro
                                                                                       361 TyrLeuAlaPheSerAlaIleIleAlaAlaGlyIleSerGlyIleGluGluLysLeuGlu
                                                                                                                                                                                                                                                                                                                                                                                                                                                           5062 CTGGACGAACCTTTTGTGGGCGATGCCTATAGCGCGGTGAGGCTGAAGGAAATTCCTTAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          401 SerieuGlnAsnAlaThrHisLeuLeuLysGluSerLysMetLeuAsnLysThrPheGly
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            5122 ACGCTGCGCGAGGCGGCTGCGGCTCAAAGGTTCCGCTTTCCTGAAAGAAGCCTTCGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sinorhizobium meliloti (Rhizobium meliloti)
Sinorhizobium meliloti
Bacteria; Proteobacteria; Alphaproteobacteria; Rhizobiales;
Rhizobiaceae; Sinorhizobium/Ensifer group; Sinorhizobium.
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/gene="SMc01575"
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VERSION
KEYWORDS
SOURCE
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AUTHORS
TITLE
JOURNAL
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SGS

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AGYRLCGEGSKAIRIECRVGGSDLNPYLAFAALIAAGIAGIENKMELEAPFVGDAYQG
KEVREIPHTLREAGEALSGSKMLRAAFGEEVVDHYVHAAEWEQQEYDRRVTDWEVARG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GAGATGGAGACCGTGCCCGGCTACAAGGCGACGAGCTGGGAGAAAGGTTACGGCGACTAC 7799
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | IleHisMetSerLeuGlnAspAlaGluThrGluLysAsnAlaPheTyrAspGlnAsnAsp 280
                                                                                             /gene="SWc01597"
complement(8131. .9678)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8038 ATGAGCTATTCGTTCGAGGAACTGAAAGAGGATGTTGCCGCCGGGCGCATCGACACGGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       21 ValLeuAlaCygValAspMetGlnGlyArgLeuMetGlyLygArgLeuThrGlyArgHis :::
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1918 TTGTGGAAAGCGCGTGGAAGAAACGCATAGCTGCAACTACCTGCTTGCGACGACATG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   101 AlalleSerAsnProHisAsnPheValThrSerGluProLeuPheCysSerProArgVal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GluLeuGluPheAsnLeuPheAsnGluThrTyrLysSerAlaSerGlnLysHisTrpLys
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GluThrPheMetArgSerValArgAsnLysLeuGluGluAlaGlyIleLeuMetGluAla
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ThrMetAlaAspArgHisIleIleAlaLysHisGlyValargGluMetAlaGluGlnSer
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                                                                                                                                                                                                                                                                                                                                                                                                                                            MetThrlleThrTyrAspGluLeuAsnAsnLeuIleArgAsnGlyLysIleAspThrVal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PheLeuGlyLeuAspGlnLysLysIleSerIleSerThrPheValTyrAlaValThrIle
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61 GluGly1leAlaGlyGlyGlyTyrGluIleSerSerValAspThrGlyTyrSerAspCys
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       81 HisLeuCysAlaAspLeuAsnSerLeuHisLeuLeuProTrpSerGluGlyAlaValLeu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     7798 ACGATGAAGCCCGACCTTTCGACGCTCCGGCGCATTCCGTGGCTCGAAGGCACGGCGCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              7738 GTTCTCTGCGACATGCTGGACCATGACACGCATGCGGAGGTGCCGCATTCGCCGCGCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121 IleLeuMetGlnGlnIleGluArgLeuAlaAsnLeuLysLeuLysGlyLeuPheAlaSer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      161 AsnLeuLysThrAlaGlnProHisHisGlnTrpMetAsnIleSerAlaSerSerGlyIle
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GACCTGCAGCTCGCCAGCGGTTACAACGAGGACTACCACATCTTCCAGACGACCAAGGAA
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                                                                                                                                                                                                                                  Length:
Matches:
Conservative:
Mismatches:
                                                                                                                                                                                                                                                                                                                                                                                                 US-10-098-602A-2 (1-454) x SME591790 (1-323450)
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                                                                                                                                                                                                                                                   963.00
62.91%
43.71%
40.53%
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Best Local Similarity:
Query Match:
DB:
                                                                                                                                                                                                            Alignment Scores:
                                                                                                                                                                                                                                                                                                                                                                                                                                              -
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DKNGQYGMSELMRHYVAGQLAHASEVTYFLAPYINSYKRFWAGTFAPTKAIWSKDNRT
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predicted by Homology
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PVDGYEDAGWDKGYGDPVMKPDLSTLRLAPMLEKTALVLCDVLDHHIDDLSHGPRAVU
KKOVORLHERGYRAYFASELEFYI FDETYKGARAKRWHEMETAS PYVGGYVIHLTTRE
EPVLRAMRHILADAGI PVENSKGEWGPGQOELNVRYCKALEMADRHVI MKNAMKEIAE
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                                                                                                                                                                                                                                 Submitted (13-NOV-2001) Unite de Recherche en Biologie Moleculaire,
Laboratoire d'Immunologie et de Microbiologie, Universite of Namur,
I rue de Bruxelles, Namur 5000, Belgium
(Dases 1 to 12340)
                                                                                                                                                                                                                                                                                                                                                                       de Medecine, INSERM U431, Avenue
Estnal, A., Reznik, G., Jablonski, L., Larsen, N., D'Souza, M., Bernal, A., Mazur, M., Goltsman, E., Selkov, E., Haselkorn, R., Kyrpides, N. and Overbeek, R.

Direct Submission
Submitted (13-NOV-2001) Integrated Genomics, Inc., 2201 W. C Park Drive, IL 60612, USA
S. (Dassel I to 12340)
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                                                                                                                                                                                                                                                                                                                                                                   Submitted (13-NOV-2001) Faculte
Kennedy, Nimes 30900, France
Location/Qualifiers
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Direct Submission
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                                                                                                                                                                                                                 TITLE
JOURNAL
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AUTHORS
TITLE
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JOURNAL
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of 107 of the
                                        ATCCACCAGTCGCTCTGGAGCAAGGACGGCGAAACGCCGCTGTTCTTCGACAAGAACGGG 7199
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                                                                                                           CAGTACGGCATGTCCGAGCTCATGCGCCACTATGTGGCCCGGTCAGCTGGCCATGCGAGC
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                                                                                                                                                                                                                                                                                                                                                                     LeuProProAlaSerGlyAsnValTyrAsnAspLysGluLeuProGluPheProAsn
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Brucella melitensis 16M

Brucella melitensis 16M

Brucellaceae; Brucella.

[ (bases 1 to 12340)

DelVecchio, V. G., Kapatral, V., Redkar, R.J., Patra, G., Mujer, C., Los, T., Ivanova, N., Anderson, I., Bhattacharyya, A., Lykidis, A., Reznik, G., Jablonski, L., Larsen, N., D'Souza, M., Bernal, A., Mazur, M., Goltsman, E., Selkov, E., Elzer, P.H., Hagius, S., O'Calladhan, D., Letesson, J.-J., Haselkorn, R., Kyrpides, N. and
                                                                                                                                                                   GlualaThrTyrPhePheAlaSerTyrIleAsnSerTyrLysArgLeuGlnProLeuThr
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  401 SerLeuGlnAsnAlaThrHisLeuLeuLysGluSerLysMetLeuAsnLysThrPheGly
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             The genome sequence of the facultative intracellular pathogen Brucella melitensis
Proc. Natl. Acad. Sci. U.S.A. 99 (1), 443-448 (2002)
11756688
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Deblocchio, V.G., Redkar, R.J., Patra, G. and Mujer, C. Direct Submission Redkar, R.J., Patra, G. and Mujer, C. Direct Submission Robert (13-NOV-2001) Institute of Molecular Biology and Medicine, University of Scranton, Scranton, PA 18510, USA 12240) And Hagius, S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Submitted (13-NOV-2001) Department of Veterinary Science, I
Center, 111 Dalrymple Building, Baton Rouge, LA 70803, USA
4 (bases 1 to 12340)
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AE009691.1 GI:17984724
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    52 SerThrPheValTyrAlaValThrileGluGlyIleAlaGlyGlyGlyTyrGluIleSer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  72 SerValAspIhrGlyTyrSerAspCysHisLeuCysAlaAspLeuAsnSerLeuHisLeu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3278 GGTTGGGACAAAGGCTATGGCATTTCGTCATGAAGCCGGATCTCTCCCACGCTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                110 ThrSerGluProLeuPheCysSerProArgVallleLeuMetGlnGlnIleGluArgLeu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        3164 ---CATGACGATCTTTCCCATTCGCCGCGCGCGCCGTCCTGAAAAACAGGGCGCGCCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              130 AlaAsnLeuLysLeuLysGlyLeuPheAlaSerGluLeuGluPheAsnLeuPheAsnGlu
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GRVLPWSELVFATGARARIPDVPGVALEGVVTLRRMEDARRIAAMMPDVRNVVIIGGG
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                                                                                                                                                                                                                                                                                                                                                                                                                                   Direct Submission
Submitted (27-SEP-2001) Department of Microbiology, University of
Washington, 1959 NE Pacific Ave, Box 357242, Seattle, WA
98195-7242, USA
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/note="identified by sequence similarity; putative; ORF
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                            the natural genetic engineer Agrobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /organism="Agrobacterium tumefaciens str. CS8
Washington)"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note="putative; ORF located using /codon start=1 /transT_table=11
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                                                                         Science 294 (5550), 2317-2323 (2001)
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complement (77. .793)
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/strain="C58"
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complement(77. .793)
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/gene="Atu2137"
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/gene="Atu2137"
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/transl_table=
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                            The genome of th
tumefaciens CS8
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REFERENCE
AUTHORS
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Agrobacterium tumefaciens str. CS8 (U. Washington)
Bacteria; Proteobacteria; Alphaproteobacteria; Rhizobiales;
Rhizobiaceae, Rhizobium/Agrobacterium group; Agrobacterium.

E (Dasses 1 to 10069)
S Wood, D.W., Setubal, J.C., Kaul, R., Monks, D., Chen, L., Wood, G.E., Chen, Y., Woo, L., Kitalima, J.P., Okura, V.K., Almeida Jr., N.F., Zhon, Y., Bovee Sr., D., Chapman, P., Clendenning, J., Deatherage, G. Gillet, W., Grant, C., Guenthner, D., Kutyavin, T., Levy, R., Li, M., McClelland, B., Palmieri, A., Raymond, C., Rouse, G., Saenphimmachak, C., Wu, Z., Gordon, D., Eisen, J.A., Paulsen, I., Karp, P., Romero, P., Zhang, S., Yoo, H., Tao, Y., Biddle, P., Unng, M., Krespan, W., Perry, M., Gordon-Kamm, B., Liao, L., Kim, S., Hendrick, C., Zhao, Z., Dolan, M., Tingey, S.V., Tomb, J., Gordon, M.P., Olson, M.V.
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2207 ACCGCCCATTGGGAGCAGATCGAATATGACCGCCGCGTGACCGACTGGGAGCTCTACCGC 2148
2867 CAGGAGCTGAACGTGCGCTATTGCAAGGCGCTTGAAATGGCCGATCGCCACGTCATCATG 2808
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AE009164 AE008688
AE009164.1 GI:17740599
                                                                                                           LeuSerSerThrAlaLeuGlyAsnAlaCysHisIleHisMetSerLeuGlnAspAlaGlu
                                                                                                                                                                                                                 IleAsnSerTyrLysArgLeuGlnProLeuThrPheAlaProThrLysCysTrpAla
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TyrAsnAspLysGluLeuProGluPheProAsnSerLeuGlnAsnAlaThrHisLeuLeu
                                                                                                                                                                                                                                                                                     270 ThrGluLysAsnAlaPheTyrAspGlnAsnAspGluTyrGlyMetSerThrLeuAlaArg
                                                                                                                                                                                                                                                                                                                                                                                    AsnTrp11eAlaGlyLeuLeuLysTyrValProGluAlaThrTyrPhePheAlaSerTyr
                                                                              LysHisGlyValArgGluMetAlaGluGlnSerGlyMetValAlaThrPheMetAlaLys
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SOURCE
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AUTHORS
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YSLSRAGYFPTVLSITHSKYRTPYVANITGAIVGLAVMLVIWFSLGAEQGGSIIGSVL
LNMAVFGAMFSYIMQAISFILLRKNLPNIERPFRSPFGIPGALLTIIIAIVTLLYQIO
DPNFTKGVLWVAVWFAVAIAYFAFVGRHRLILSPEEEFALEHKQAAVAAAAKA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /protein_id="AAL43131.1"
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HERREVEIGILHDNDSRLADAMLAGAEGASLTVRRNDPYGPEDGVTHTLRLHALPDG
LLNVMIEIRNDLIANEGEQAAIAGFLHELMGKALSSIEE"
                                                                                                                                                                                                                                                GGEVTGLCENVEYVLTPAVVVTFITAVVNSILGLDPAYSPFVMIVFYAIFLALNVFGL
ELSFKVTLVITLISLAVLVFFWISAIPNIDFSRFALNIGVGPDGKAVELPEGGGSFFP
FGFSGVLATLPFAVWLFLAIEQLPLAAEESVDPKRDMPKGIILGMVTLMVSAFMIVLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /trānslation="MDSSSSGVSYKKADASYFEKRGLSRYAGVWSLWALGVGAVISGH
FSGWNFGFSTGGWGGMLVAGIIIAIWYLGLTFSIAEMSPALPHTGAAYSFARTAMGPW
                                                                                                                                                                                                                                                                                                                           NPSLPGVGAFHLSSSLEPLLDGFKAIYGDGGVVLLGLVALTGLIASFHTILYAQGRQI
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       'note="identified by sequence similarity; putative; ORF
'ocated using Blastx/Glimmer"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ^note="identified by sequence similarity; putative; ORF
coated using Blastx/Glimmer"
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Conservative:
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                                                                                                                                                    /protein_id="AAL43133.1"
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complement(7967. .8740)
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/transl_table=11
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/transl_table=11
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/protein_id="AAL43130.1"
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PENLTAMGIKPDRIDELAAEAIKDPSCGGNPVPMTLENTKALFEACF"
                                                                                                                                                                                                                                                                                                                                                                                           APLVIEESGNFERRIEREAHGVVFVIAPWNYPYMTAINTVAPALMAGNTVVIKHAAQT
LLVGERMVRAFVEAGYPEDVETNVFLDHGTTSTLISEGLFNFVNFTGSVEGGRAIERA
AAGTFTGLEGLEGKDPGYVMEDADLDAAVDTLMDGGTYNSGQCCCGIERIYVNENLY
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ASLWTQDAARAARIGREIETGTVFWNRADYLDPALCWTGVKETGRGGSLSVLGFQNLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /trānslation="MTGDQIDKSWFSQQLKRKGKSQADLARFLNLDRSAVTRMLNGDR
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EALTWADRHAIIKNATKEIAWSKGKAVTFLAKWNYNAAGSSSHIHQSLWSLDGKPAFL
SKOEBIGGSDVRHYYNGLAHASDITYFLAPY INSYKREWAGTRAPTKAIWSLDNRT
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KDVREIPKTILRDATAFLDGSKMLRQAFGDDVVDHYVHAARWEQEEYDRRVTDWEVARG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 translation="MTSYTFDALKMDVAEGRIDTVLACLVDMQGRLMGKRFQAEFFVE"
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LCDVLDHHTHEEVPHSPRALLKKQVARLEAMGLKAYMATELEFFLFDQTFDAARASGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KDLNLASGYNEDYHI FQTTKEEDVMRALRKGLQGAGI PVENSKGEASPGQAEINVRYA
                                                                                                                                                 note="identified by sequence.similarity; putative; ORF ocated using Blastx/Glimmer"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  note="putative; ORF located using Glimmer"

(codon start=1
(transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       note="putative; ORF located using Glimmer"
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protein_id="AAL43132.1"
db_xref="G1:17740606"
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complement (4799. .6163)
                                                                       complement (2493. .3881)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement (3899. .4165)
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                                                                                                                        complement (2493. .3881)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             complement (4799. .6163)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="Atu2143"
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trans1 table=11
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gene="glnA"
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63

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5852

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MYTLMVSAFMIVLLNPSLFGVGAFHLSSSLEPLLDGFKAIYGDGGVVLLGLVALTGEL
SEPHTILYGAGRQIYSLSRAGYFPTVLSITHSKYRPPVANTTGAIVGLAVMLVHFS
LGAEGGSIIGSVLLIMMAVFGAMFSYIMQAISFILLRKNLPNIERPFRSPFGIFGALL
IIIAIVTLLYQIQDDPNFTKGVLWVAVWFAVAIAYFAFVGRHRLILSPEEEFALEHKO
                        VFYAI FLALNVFGLELSFKVTLVI TLI SLAVLVFFWI SAI PNI DFSRFALNI GVGPDG
KAVEL PEGGGS FFPFGFSGVLATL PFAVWLFLAI EOLPLAAEESVDPKRDMPKGI I LG
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LLNVMIEIRNDLIANEGEQAAIAGFLHELMGKALSSIEE"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DSAAGTDVYFSHAPAEDRRGKSLRSTTATVSDVIHAHYDALTRSEKRLAESLLGNYPV
SGLGSITTIAENAGVSTPTVARMVQKLGYKGYPEFQAHLHQELEATISGPVAKHDRWA
TNAPGLHILNRFADAITGNLRDTLGDLDTAVFDNAARLLSDRKRSIYPVGGRITGAIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EYFFTHMQVIRPKTTLMSSNSSAWPQYMLNMSAGDVLVIFDIRRYBHDMTTLAEVAKA
NGVQIILFTDQWTSPVARHALHTFRVRIBAPSAWDSSVVTLFVVBALIBAVQNGTWDB
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| Drote="GI:1517884"
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GAAYSFARTAMGPWGGFVTGLCENVEYVLTPAVVVTFITAYVNSILGLDPAYSPFVWI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   6080 CTTGTCGACATGCAGGGGGGTCTGATGGGCAAACGGTTCCAGGCGGAATTCTTCGTTGAA 6021
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4 Thr Tyr AspGluLeuAsnAsnLeuIleArgAsnGlyLysileAspThrValValLeuAla 23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      44. LeuAspGlnLysLysIleSerIleSerThrPheValTyrAlaValThrIleGluGlyIle 63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        64 AlaGlyGlyGlyTyrGlulleSerSerValAspThrGlyTyrSerAspCysHisLeuCys 83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |||:::||| |||||||:::
| ACATICGACGCACTIAAAAIGGAIGTCGCCGAGGGGGCGCAICGACACTGTICTGGCCTGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            24 CysValAspMetGlnGlyArgLeuMetGlyLysArgLeuThrGlyArgHisPheLeuGly
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         6020 AGCGCCTTTGAGGAAACCCATAGCTGCAACTATGTGCTTGCCACCGACATGGAGATGGAA
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/gene="AGR C 3887"
complement (7956. .8729)
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8704. 9780 C_3888"
/note="hypothetical protein PA5506 (imported)
Pseudomonas aeruginosa (strain PAO1)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  11253
195
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165
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Matches:
Conservative:
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Indels:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ,3889"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US-10-098-602A-2 (1-454) x AE008130 (1-11253)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps:
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                                                                                                                                                                                                                                                                                                                                                               codon start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /codon_start=1/transl_table=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 product = "AGR
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942.50
63.11%
43.33%
39.67%
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Percent Similarity:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Alignment Scores:
Pred. No.:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match:
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LPQLVHKDPIDRILITTAREHDLTIITRDRVILAYGEAGHVKTLAC"
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complement [4788 . .6152)
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/note="probable glnA4 protein - Mycobacterium tuberculosis (strain H37RV)"
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STTESRHPIFGCMKGTITVMPDVDLTKPVDFEWGEKLYNE"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KDLNLASGYNEDYHI FQTTKEEDVMRALRKGLQCAGI PVENSKGEASFQQAEINVRYA
EALTWADRHAI I KNATKEI AWSKGKAVTFLAKWNYNAAGSSSHIHQSLWSLDGKPAFL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DKOGEHGMSDVMRHYVAGLIAHASDITYFLAPYINSYKRFMAGTFAPTKAIWSLDNRT
AGYRLCGAETKGIRI ECRVGGSDLNPYLAMAALLAAGIDGIENKLELEPAFVGDAYGG
KDVREI PKTLRDATAFLDGSKMLRQAFGDDVVDHYVHAARWEQEEYDRRVTDWEVARG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SAFEETHSCNYVLATDMEMETVPGYKSSSWEKGYGDYTLKPDLSTLRKVPWLEGTALV
LCDVLDHHTHEEVPHSPRALLKKQVARLEAMGLKAYMATELEFFLFDQTFDAARASGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /trānslation="MADWLVFFLSGEKGMDSSSSGVSYKKADASYFEKRGLSRYAGVW
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                                                                                                                                                                                                  LLVGERMVRAFVEAGVPEDVFINVFLDHGTTSTLISEGLFNFVNFTGSVEGGRAIERA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             note="probable transport protein PA4023 {imported} seudomonas aeruginosa (strain PAO1)"
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complement (3888. .4334)
/gene="AGR C.3881"
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complement (6218. .7774)
/gene="AGR C 3885"
/note="probable transport pi
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db_xref="GI:15157280"
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/db_xref="GI:15157282"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               complement (4297, .4725)
/gene="AGR C 3882"
complement (4297, .4725)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    codon start=1
trans _table=
                                                                                                                                                                                                                                                                                                                                  RPKSYHLKKVTK"
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Details of M. tuberculosis sequencing at the Sanger Centre are available on the World Wide Web.

(URL, http://www.sanger.ac.uk/Erojects/M_tuberculosis/) CDS have been renumbered from the original cosmid submissions but the old gene designations are in brackets after the new gene numbers.

Gene prediction was based on a Hidden Markov Model of TB genes implemented in TBparse (Krogh) supplemented with visual inspection of positional base preference in codons, especially where there is an increase in the observed/expected third position G + C.

CAUTION: In some cases we may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg, gtg, or ttg) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon). If this cannot be identified we choose the most upstream
                                                                                     13246 bp DNA linear BCT 02-SEP-2002
Mycobacterium tuberculosis H37Rv complete genome; segment 125/162.
AL008883 AL123456
AL008883.1 GI:3261490
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Submitted (11-JUN-1998) Submitted on behalf of the Mycobacterium tuberculosis sequencing and mapping teams, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 ISA Unite de Genetique Moleculaire Bacterienne, Institut Petur, 28 rue du Docteur Roux, 75724 Paris Cedex 15, France E-mail: parkhill@sanger.ac.uk On Jun 27, 1998 this sequence version replaced gi:2612801.
                                                                                                                                                                                                                                                                                                                                                          Cole, S.T., Brosch, R., Parkhill, J., Garnier, T., Churcher, C.,
Harris, D., Gordon, S.V., Eiglmeier, K., Gas, S., Barry III, C.E.,
Fekaia, F., Badocock, K., Badama, D., Chillingworth, T.,
Connor, R., Davies, R., Devlin, K., Feltwell, T., Gentles, S.,
Hamlin, N., Holroyd, S., Hornsby, T., Jagels, K., Krogh, A., McLean, J.,
Moule, S.; Murphy, L., Oliver, S., Osborne, J., Quail, M. A.,
Rajandream, M.A., Rogers, J., Rutter, S., Seeger, K., Skelton, S.,
Barrell, B.G.
                                                                                                                                                                                                                                                                             Bacteria; Actinobacteria; Actinobacteridae; Actinomycetales;
Corynebacterineae; Mycobacteriaceae; Mycobacterium; Mycobacterium
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Nature 393 (6685), 537-544 (1998)
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/note="fragment designated v003. Does not represent a
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                    /organism="Mycobacterium
/mol_type="genomic DNA"
/strain="H37Rv"
AspTrpGluLeuAsnGlnGlyPheAsnArg
                                                                                                                                                                                                                                     Mycobacterium tuberculosis H37Rv
Mycobacterium tuberculosis H37Rv
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/note="Pv2857c"
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complement(60..836)
/gene="Rv2857c"
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Parkhill,J.
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AUTHORS
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                 AlaAspleyAsnSerLeyHisLeuLeuProTrpSerGluGlyAlaValLeyAlaIleSer
                                                                                                                                                                                          124 GlnGlnIleGluArgLeuAlaAsnLeuLysLeuLysGlyLeuPheAlaSerGluLeuGlu
                                                                                                                                                                                                                   PheAsnLeuPheAsnGluThrTyrLysSerAlaSerGlnLysHisTrpLysAsnLeuLys
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gene

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/Mote="RV2660c, (MTV003.06c), unknown, len: 457 aa.glnA4, Probable glutamine synthetase class II, glnA4; similar to many glutamine synthases eq. sp[P10656[GANA CLOAB GLUTAMINE SYNTHETASE (EC 6.3.1.2) (443 aa) fasta scores; opt: 609 z-score: 750.0 E(): 0; 30.7% identity in 446 aa overlap;and GLNA BACCE P19064 glutamine synthetase (ec 6.3.1.2) (443 aa), fasta scores; opt: 572 z-score: 669.3 E(): 4e-30, 30.8% identity in 455 aa overlap. Also similar to M. tuberculosis glutamine synthases eg. MTCV427.03c (31.1% identity in 453 aa overlap)
DGGDPLRPASPRLRSPLGASRPVVGLTAYLEQVRTGVWDIPAGYLPADYFEGITWAGG
YALLDPOPUPESVGCVLDSLAALVTGGYDLDPAAYQGEHPATDIPRPRGRANWEP
ALLRGALQRGMPVLGICRGTQVLWYALGGTLHQHLPDILGHSGHRAGNGVFTRLPVHT
ASGTRLAELIGESADVPCYHHQAIDQVGEGLVVSAVDVDGVIEALELPGDTFVLAVQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WASGYRGI.TPASDYNIDYAILASSRMEPLIRDIRLGMAGAGLRFEAVKGECNMGQQEI
GPRYDEALVTCDNHAIYKNGAKEIADQHGKSLIFMAKYDEREGNSCHIHVSLRGTDGS
AVPADSNGPHGMSSMFRSFVAGQLATLREFTLCYAPTINSYKRFADSSFAPTALAWGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          translation="MTGPGSPPLAWTELERLVAAGDVDTVIVAFTDMQGRLAGKRISG
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YQGADVERLPVTLADAAVLFEDSALVREAFGEDVVAHYLNNARVELAAFNAAVTDWER
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P07906 methionine aminopeptidase (ec 3.4.11.18) (264 aa)
                                                                                                                                                                                                                                                                                                                                                                                                 complement (3171519. .3171569) "
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      complement (3171573. .3171613)"
                                                                                                                                                                                                                                                                                                        complement (3171465. .3171515) "
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="possible RBS upstream of Rv2859c"
complement(4485. .4489)
/note="possible RBS upstream of Rv2860c"
                                                                                                                                                                                                             /note="possible RBS upstream of Rv2858c"
complement(2945. .2995)
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                                                                                                                        HPEKSLDDLRLFKALVDAASGYAGRQSQAEPR"
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Matches:
Conservative:
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|db_xref="G1:2612805"
|db_xref="SPTREMBL:033342"
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                                                                                                                                                                                                                                                                                                        /note="FT repeat unit cocomplement(2999 ... 3049)
                                                                                                                                                                                                                                                                                                                                                                                                 /note="FT repeat unit complement(3053. ...3093)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="FT repeat_unit complement(3104._.4477)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  complement (3104. .4477)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             complement (4637. .5494)
                                                                                                                                                          complement (2206. .2209)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement (3128. .3131)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    complement (4637. .5494)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US-10-098-602A-2 (1-454) x MTV003 (1-13246)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      transl_table=11
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                                                                                                                                                                                    /gene="Rv2859c"
                                                                                                                                                                                                                                                                                                                                                                        gene="Rv2859c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="Rv2859c"
                                                                                                                                                                                                                                                                                  /gene="Rv2859c"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="glnA4"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gene="glnA4"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    6.33e-64
799.50
58.02%
38.68%
33.65%
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gene="map
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Query Match:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Alignment Scores:
Pred. No.:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        //ncre="Rv2858c, (MTV003.04c), len: 455 aa. aldC,
Probablealdehyde dehydrogenase, aldC; similar to many eg.
Probablealdehyde dehydrogenase, aldC; similar to many eg.
FRAB_ECOLI P80668 phenylacetaldehyde dehydrogenase (499
aa), fasta scores; opt: 1074 z-score: 1239. Z E(): 0, 42.2%
identity in462 aa overlap. Contains PS00687 Aldehyde
dehydrogenases guerlap. Contains PS00070 Aldehyde dehydrogenases cysteine active site. Also similar
to many M. tuberculosis dehydrogenases eg. MTCV369.13
(38.1% identity in 467 aa overlap)"
/codon_start=1
/trans__table=11
                                                                                                                                                                                                                                                                                                                                  EAGGAAADELSGLFVPTDVČDEDAVNGLFDGAAETYGRIDIAFNNAGISPPEDNLIEN
TELAAWGVODVNLKGYYLCCRAALHHVLAGKGSINYTASFYNAWGSATSQISYTAS
KGGVLAMSRELGVODRARQGIRVNALCPGPVNTPLLQELFAKNPERAARRWHVPLGRF
AEPDELAAAVAFLASDDASFITASTFLVDGGISSAYVTPL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LTTMRLGELAVEAGLDEDLLQVLPGKGTVVGERFVTHPDIRKIVFTGSTEVGKRVMAG
AAAQVKRVTLELGGKSANIVFHDCDLERAATTAPAGVFDNAGQDCCARSRILVQRSVY
DRFMELLEPAVHSIVVGDPGSRATEMGPLVSRAHRDKVAGYVPDDAPVAFRGTAPAGR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /db_xref="SPTREMBL:033341"
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                                                                                                                                                                                                                                                                         /db_xref="SPTREMBL:033339"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GFWFPPTVLTPKRCDRTVTDE1FGPVVVVLTFDDEADA1SLANDTAYGLSGS1WTDDL
SRALRVARAVESGNLSVNSHSSVRFNTPFGGFKQSGVGRELGPDAPLQFTETKNVFIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /trānslation="MSTTQLINPATEEVLASVDHTDANAVDDAVQRARAAQRRWARLA
PAQRAAGLRAFAAAVQAHLDELAALEVANSGHPIVSAEWEAGHVRDVLAFYAASPERL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SGRQIPVAGGVDVTFNEPMGVVGVITPWNFPMVIASWAIAPALAAGNAVLVKPAELTP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               similar to E. coli hypothetical gene TR:P76038 (EMBL:AE000228) (258 aa), fasta scores; opt: 326 z-score: 324.5 E(): 1.46-12,30.7% identity in 238 aa overlap. Contains three 17 aa repeats at the N-terminus very similar to those in other M. tuberculosis proteins e.g. YY30_MYCTU Q10699 putative DNA polymerase CY49.30 (393:
                                                                  aa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             note="PS00070 Aldehyde dehydrogenases cysteine active
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           note="PS00687 Aldehyde dehydrogenases glutamic acid
                               overlap. Also similar to many M. tuberculosis
dehydrogenases eg. MTCY39.16c (38.3%identity in 248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (MTV003.05c), len: 308 aa. Unknown;
   632.1 E(): 4.7e-28, 38.0% identity in 250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note="possible RBS upstream of Rv2857c"
complement(1400, .1435)
/gene="aldC"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /transl_table=11
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                                                                                                                                                                    /product="hypothetical protein Rv2857c"
(protein id="CAA15519.1"
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db_xref="SPTREMBL:033340"
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/gene="Rv2859c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement (1496. .1519)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                             complement (833. .2200)
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trans table=11
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transl_table=
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                                                                                              overlap)
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gene

CDS

RBS

3 IleThrTyrAspGluLeuAsnAsnLeulleArgAsnGlyLysIleAspThrValValLeu 22

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EAGGAAADELSGLFVPTDVCDEDAVNGLFDGAAETYGRIDIAFNNAGISPPEDNLIEN
TELAAWQRVQDVNLKSVYLCCRAALRHMVLAGKGSIVNTASFVAVMGSATSOISYTAS
KGGVLAMSRELGVQFARQGIRVNALCPGFVNTPLLQELFAKNPERAARRMVHVPLGRF
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of the
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       l (bases 1 to 14715)
Fleischmann, R.D., Alland, D., Eisen, J.A., Carpenter, L., White, O., Peterson, J., DeBoy, R., Dodson, R., Gwinn, M., Haft, D., Hickey, E., Kolonay, J.F., Nelson, W.C., Umayam, L.A., Ermolaeva, M., Salzberg, S.L., Delcher, A., Utterback, T., Weidman, J., Khouri, H., Whole genome comparison of Mycobacterium tuberculosis clinical and laboratory strains
                 LeuGluLeuProProProAlaSerGlyAsnValTyrAsnAspLysGluLeuProGluPhe 398
                                                                                        ProAsnSerLeuGlnAsnAlaThrHisLeuLeuLysGluSerLysMetLeuAsnLysThr 418
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mycobacterium tuberculosis CDC1551
Mycobacterium tuberculosis CDC1551
Bacteria, Actinobacteria, Actinobacteridae, Actinomycetales,
Corymebacterinese, Mycobacteriacese, Mycobacterium, Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Direct Submission
Submitted (25-APR-2001) The Institute for Genomic Research, 9712
Medical Center Dr. Rockville, MD 20850, USA
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Toases I to 14715)
Fleischmann, R.D., Alland, D., Eisen, J.A., Carpenter, L., White, O., Fleischmann, R.D., Alland, D., Eisen, J., BeBoy, R., Bodson, R., Gwinn, W., Haft, D., Hickey, E., Kolonay, J.F., Nelson, W.C., Umayam, L.A., Ermolaeva, M., Salzberg, S.L., Delcher, A., Utterback, T., Weidman, J., Khouri, H., Gill, J., Mikula, A. and Bishai, W.
                                                                                                                                                                                    3334 CTTCAGCTGCCCGAGCCCTGTGGCAACGCCTACCAAGGCGCCGATGTCGAACGGCTG
                                                                                                                                                               PheGlyGluLysLeulleLeuHisTyrValAsnAlaAlaAsnValGlulleAsnGluPhe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  by sequence
                                                                                                                                                                                                                                                                                                                              Mycobacterium tuberculosis CDC1551, section 203 of 280 complete genome.
AE007117 AE00516
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                                                                                                                                                                                                                                                             SerLysGlnValThrAspTrpGluLeuAsnGlnGlyPheAsnArg 453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="similar to GB:AE000512; identified similarity; putative" /codon start=1 /trans[_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AEPDEIAAAVAFLASDDASFITASTFLVDGGISSAYVTPL"
complement (921. .2288)
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/organism="Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /mol_type="genomic DNA"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /db_xref="taxon:83331"
/note="clinical strain"
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                 379
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KEYWORDS
SOURCE
ORGANISM
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AE007117/c
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AUTHORS
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AUTHORS
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JOURNAL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3452
                                                                                                                                1333 GACGACATAGCCACCGGGGGGTGGTGGTGCTGCTGTTATCTGCTGGCGTGGACGTCGAC 4274
                                                                                                                                                                                                                                                                              3865 GAGGCGGTCAAAGGCGAATGCAACATGGGCCAGCAGAGATCGGCTTTCGTTACGACGAG 3806
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CAGCACGCCAAGAGCCTAACGTTCATGGCGAAATACGATGAACGCGAA---GGTAATAGC 3689
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3451 GTGGTT---GGCCACGGCCAAAACATCCGGGTCGAATGCCGGGTTCCCGGCGGTGATGTC 3395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         4453 TTGGCGTGGACCGAGTTGGAGCGACTGGTCGCGGCCGGTGACGTCGACACCGTCATCGTC 4394
                                                                                                                                                                                                         CTGAACACGGTGCCCGGCTATGCGATGGCCAGTTGGGACACCGGCTACGGCGATATGGTG 4214
                                                                                                                                                                                                                                                                                                                                                                                                           138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  139 AlaSerGluLeuGluPheAsnLeuPheAsnGluThrTyrLysSerAlaSerGlnLysHis 158
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         159 TrpLysAsnLeuLysThrAlaGlnProHisHisGlnTrpMetAsnIleSerAlaSerSer 178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           218
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              299 ValProGluAlaThrTyrPhePheAlaSerTyrIleAsnSerTyrLysArgLeuGlnPro 318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AsnProTyrLeuAlaPheSerAlaIleIleAlaAlaGlyIleSerGlyIleGluGluLys 378
                                                                                                                                                                                                                                                         LeuCysAlaAspLeuAsnSerLeuHisLeuLeuProTrpSerGluGlyAlaValLeuAla 101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GlylleGluThrPheMetArgSerValArgAsnLysLeuGluGluAlagGlyIleLeuMet 198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CysHisIleHisMetSerLeuGlnAspAlaGluThrGluLysAsnAlaPheTyrAspGln 278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LeuCysAsnSerLysSerGluGlyIleAsnValGluLeuArgIleGlyGlyAlaAspLeu 358
                                    42
                                                                                                           61
                                                     AlaCysValAspMetGlnGlyArgLeuMetGlyLysArgLeuThrGlyArgHisPheLeu
                                                                                                           ---GlyLeuAspGlnLysLysIleSerIleSerThrPheValTyrAlaValThrIleGlu
                                                                                                                                                                                  GlylleAlaGlyGlyTyrGluIleSerSerValAspThrGlyTyrSerAspCysHis
                                                                                                                                                                                                                                                                                                                                  102 IleSerAsnProHisAsnPheValThrSerGluProLeuPheCysSerProArgValIle
                                                                                                                                                                                                                                                                                                                                                                                                         LeuMetGlnGlnIleGluArgLeuAlaAsnLeuLysLeuLysGlyLeu-----Phe
                                                                                                                                                                                                                                                                                                                                                                                                                              |||| :::|||:::::|||| CTGCGCCGCGCGCGACTGGTCGCCGATGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3985 TATCGCGGGCTGACCCGGCCAGCGACTACAACATCGACTACGCGATATTGGCATCCTCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ProteuThrMetAlaAspArgHisIleIleAlaLysHisGlyValArgGluMetAlaGlu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GinSerGlyMetValAlaThrPheMetAlaLysLeuSerSerThrAlaLeuGlyAsnAla
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TTGGGGAATTCACGCTGTGTTGCGCGACCATTAACTCCTACAAGCGATTTGCCGAT
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ACCQRRGVTRIKTFDHTLASAFRS"
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BOTGTVAXTRSWHLFKDRIWTYDGQLKMARDEGKWHYRWTTSGLHPKKGBHQTFALRA
DPPRRASVNEVGGTDVLVPGYLYHYSLDAGQAGRELFGTAHAVGALHPFDDTLNDPQ
LLABQASSSTQPLDLYTLHADDSNRYAAAIGQLPGVVTTPQAELLPTDKHFAPAVLND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   translation="MSRPVSPSQFLTSATMVTKTTLASATSGLLLLAVVAMSGCTPRP"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VKKAVVDELDGKAGWRVVSVNQNGVDVSVLHEVAPSPASSVSITLDRVVQNAAQHAVN
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ATPETLLGCPGEIDIGHRTIPNYGGFDLGVVPMSRAFASSCNTTFAELSSRLPPRGLT
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GEAEFPGGSHSWFAGYRGDLAFASLIVGGGSSEYAVRMTKVMFESLPPGYLA"
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HCREDSRWQLVEVSTRGCGEPHGVRHRSVGASRDAEFGADLVFAVGAAGGNVGVGFSD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /product="penicillin-binding protein, putative"
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/db_xref="GI:13882708"
                                                                                                                  /codon start=1
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                                                                                                                                                                                                                                                                                                                                                                                                                                                            5312. .6506
/gene="MT2931"
/note="identified by Glimmer2; putative"
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//codon start=1
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                                                                                        'note="identified by Glimmer2; putative"
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                                                                                                                                                                                                                                                                                                                                                                      PAEGTPHVVLTGRMVCGSVVIKGPRRALLRRHRG"
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/db_xref="GI:13882709"
                         complement (5570. .6154)
/gene="MT2930"
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                                                                                                                                                                                                              protein_id="AAK47255...
db_xref="GI:13882705"
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/transl_table=11
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/gene="MT2932"
                                                                                                                                                                                                                                                                                                                                                                                                      6312. .6506
/gene="MT2931"
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GYLPADYFEGITWAGGVAVLLPPQPVDPESVGCVLDSLHALVITGGYDLDPAAYGGEP
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GHRACNGVFTRLPWTRASGTRLAELIGESADVPCYHHQAIDQVGEGLVVSAVDVDGVI
EALELPGDTFVLAVQWHPEKSLDDLRLFKALVDAASGYAGRQSQAEPR"

complement (3138 . 4511)
                                                                                                                                                                                                                                                                                                /translation="MSTTQLINPATEEVLASYDHADANAVDDAVQRARAAQRRWARLA
PAQRAAGLRAFAAAVQAHLDELAALEVANSGHPIVSAEWEAGHVRDVLAFYAASPERL
SGRQIPVAGGVDVTFNEPMGVVGVITPWNFPWVIASWAIAPALAAGNAVLVKPAELTP
                                                                                                                                                                                                                                                                                                                                                                                                                         AAAQVKRVTLELGGKSANIVFHDCDLERAATTAPAGVFDNAGQDCCARSKILVQRSVY
OFKBELLEBAAHSIVVGDPGSRATEMFPLVSRAHRDKVAGVPDDAPVAFRGTAPAGR
GFWFPFTULTPRRGGTVTDBIFGPVVVLFDDEADISLANDTAGLSGSIWTDDL
SRALRVARAVESGNLSVNSHSSVRFNTPFGGFKQSGVGRELGPDAPLQFFETKNVFIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /product="glutamine synthetase, putative"
/protein_id="AAK47253.1"
/brotein_id="AAK47253.1"
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/translation="WTGPSPLAWTELERLVAAGDVDTVIVAFTDMGGRLAGKRISG
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PGTALVIADLVWADGSEVAVSPRSILRRQLDRLKARGLVADVATELEFIVFDQPYRQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         WASGYRGLTPASDYNIDYAILASSRMEPLLRDIRLGMAGAGLRFEAVKGECNMGOQEI
GRRYDBAUYCDNHIYKNGAKEIADCHGKSLTFWAKYDEREGNSCHIHVSLKGTDGS
AVFADSNGPHGMSSMFRSFVAGQLATLREFTLCYAPTINSYKRFADSSFAPTALAWGL
DNRTCALRVYGHGGNIYVECRYPGGDVNQYLAVAALIAGGLYGIERGLOLPEPCYGNA
YQGADVERLPVTLADAAVLFEDSALVREAFGEDVVAHYLNNARVELAAFNAAVTDWER
                                                                                                                                                                                                                                                                                                                                                                                            LTTMRLGELAVEAGLDEDLLQVLPGKGTVVGERFVTHPDIRKI VFTGSTEVGKRVMAG
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PID:473823; identified by sequence similarity; putative"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /trānslation="MPSRTALSPGVLSPTRPVPNWIARPEYVGKPAAQEGSEPWVQTP
EVIEKMRVAGRIAAGALAEAGKAVAPGVTTDELDRIAHEYLVDNGAYPSTLGYKGPPK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SCCTSLNEVICHGI PDSTVITDGDIVNIDVTAYIGGVHGDTNATFPAGDVADEHRLLV
DRTREATMRAINTVKPGRALSVIGRVIESYANRFGYNVVRDPTGHGIGTTFHNGLVVL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /noce="almilar to SP:P36205 GB:X60160 PID:48181.
GB:AE000512; identified by sequence similarity; putative"
                                                                                     note="similar to PID:2228233; identified by seguence
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protein id="AAK47251.1"
'db xref="GI:13882701"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               product="glutamine amidotransferase, putative"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                'transT_table=11
'product="methionine aminopeptidase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            protein_id="AAK47252.1"
db_xref="GI:13882702"
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db_xref="GI:13882704"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement (2285. .3085)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complement (4671. .5528)
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                            complement (921. .2288)
                                                                                                                     imilarity; putative"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               codon_start=1
transl_table=11
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Districted (12-MAR-2003) Garnier T., Unite de Genetique Moleculaire Bacterienne Institut Pasteur 28 rue du Dr Roux 75724 PARIS cedex 15. France. e-mail:tgarnier@pasteur.fr Submitted on behalf of the Mycobacterium bovis sequencing teams, TB Research Group, Veterinary Laboratories Agency Weybridge, Woodham Lane, New Haw, Addlestone, Surrey KTI5 3NB, UK. Sanger Centre, Wellocome Trust Genome Campus, Hinxton, Cambridge CB10 15A, UK. PT4 Annotation, Genopole, Institut Pasteur, 28 Rue du Docteur Roux, 75724 Paris Cedex 15, France. Unite de Genetique Moleculaire Bacterienne, Institut Pasteur, 28 rue du bocteur Roux, 75724 Paris Cedex 15, France. Location/Qualifiere Location/Qualifiere Location/Qualifiere Novis Mycobacterium bovis subsp. bovis AF2122/97" // Mol Lype="Genomic DNA" // Sträin="AF2122/97" // Sträin="AF2122/97" // Sträin="AF2122/97"
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Pryor,M., Duthoy,S., Grondin,S., Lacroix,C., Monsempe,C., Simon,S.,
Harris,B., Atkin,R., Doggett,J., Mayes,R., Keating,L.,
Wheeler,P.R., Parkhill,J., Barrell,B.G., Cole,S.T., Gordon,S.V. and
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3605 TIGCGCGAATICACGCTGTGCTATGCGCCGACCATTAACTCCTACAAGCGATTTGCCGAT 3546
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Mycobacterium bovis subsp. bovis AF2122/97
Corynebacterineae; Mycobacteriaceae; Mycobacterium tuberculosis complex.
                                                                        3545 AGCAGTÍTOGOGOCGÁCGACGCCTGGCTTGGGGGCTGGACAATCGCACCTGCGCCCTGCGG
                                                                                                                339 LeuCysAsnSerLysSerGluGlyIleAsnValGluLeuArgIleGlyGlyAlaAspLeu
                                       319 LeuThrPheAlaProThrLysCysCysTrpAlaIleAspAsnArgThrSerAlaPheArg
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PNAS 10.1073/pnas.1130426100 (Microbiology)
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Matches:
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/Jocus tag="Mb2882c", -| Jen: 258 aa. Equivalent to Rv2857c, /noce="Mb2882c", -| Jen: 258 aa. Equivalent to Rv2857c, /noce="Mb2882c", -| Jen: 258 aa. Equivalent to Rv2857c, len: 258 aa, from Wycobacterium tuberculosis strain H37Rv, (100.0% identity in 258 aa overlap). Probable short-chain dehydrogenase freductase (EC 1-.-.), highly similar to various dehydrogenases e.g. 088068|SC135.33c PROBABLE DEHYDROGENASE (SDR FAMILY) from Streptomyces coelicolor (260 aa), FRSTA scores: opt: 1208, E(): 2-66, (72.33% identity in 253 aa overlap); 091376|Pa1649 from Pseudomonas aeruginosa PROBABLE SHORT-CHAIN DEHYDROGENASE (253 aa), PRSTA scores: opt: 569, E(): 2.18-28, (39.2% identity in 255 aa overlap); 09EX74|MLHA SDR-LIKE EMZYME from Rhodococcus erythropolis (246 aa), FASTA scores: opt: 567, E(): 2.58-28, (41.15% identity in 248 aa overlap); etc. Also similar to many Mycobacterium tuberchlosis dehydrogenases e.g. FABG3|Rv2002|MT2058|MTCY39.16c PUTATIVE OXIDORDUCTASE (250.) FASTA score: (38.3% identity in 248 aa overlap). BELONGS TO THE SHORT-CHAIN CEHVIN EXHORSEN/REDUCTASES (SDR) FAMILY."
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'db_xref="G1:31619629"
'translation="MMDLSQRLAGRVAVITGGGSGIGLAAGRRMRAEGATIVVGDVDV
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TELAAWQVQDVNLKSYYLCCRAALHNVLAGKSIVYNASFYAVWGSATSQISYTAS
KGGVLAMSRELGVOFARQGIRVNALCPGPVAYTPLLQELFAKNPERAARRWYHVPLGRF
AEPDEIAAAVAFLASDDASFITASTFLVDGGISSAYVTPL"
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PAQRAAGLRAFAAAVQAHLDELAALEVANSGHPIVSAEWEAGHVRDVLAFYAASPERL
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EC number="1.2.1.3"
note="Mb2883c, aldC, len: 455 aa. Equivalent to Rv2858c,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             trans]_table=11
product="PROBABLE ALDEHYDE DEHYDROGENASE ALDC"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /codon_start=1
/transT_table=11
/product="PROBABLE SHORT-CHAIN TYPE
DEHYDROGENASE/REDUCTASE"
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db_xref="G1:31619630"
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complement(872. .2239)
/gene="aldC"
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in Mycobacterium tuberculosis: 1010318[GARZ MYCTU]GLMR2|RV222c|MT2280|MTCY190.33c|MTCY427 03c PROBABLE GLUTAMINE SYNTHETASE (446 aa), FASTA score: (31.1% identity in 453 aa overlap); Rv1878|glnA3 and

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3434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3313 CCGGTTACGCTGGCCGACGCCGCGGTGCTGTTCGAGGATTCTGCGCTGGTGCCGCGAGGCG 3254
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Bentley, S.D., Chater, K.F., Cerdeno-Tarraga, A.M., Challis, G.L., Thomson, N.R., James, K.D., Harris, D.E., Quail, M.A., Kieser, H., Thomson, N.R., Bateman, A., Brown, S., Chandra, G., Chen, C.W., Collins, M., Braper, D.B., Goble, A., Hidalgo, J., Hornsby, T., Howarth, S., Huang, C.H., Kieser, T., Larke, L., Murphy, L., Oliver, K., O'Neil, S., Sebbinowitsch, E., Rajandream, M.A., Ruthefford, K., Rutter, S., Seeger, K., Saunders, D., Sharp, S., Squares, R., Squares, S., Taylor, K., Warren, T., Wietzorrek, A., Woodward, J., Barrell, B.G., Parkhill, J. and Hopwood, D.A.

Complete genome sequence of the model actinomycete Streptomyces coelicolor A3(2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           438
                                                                                                                                           AsnAspGluTyrGlyMetSerThrLeuAlaArgAsnTrpIleAlaGlyLeuLeuLysTyr 298
                                                                                                                                                                                                                            ValProGluAlaThrTyrPhePheAlaSerTyrIJeAgnSerTyrLygArgLeuGlnPro 318
3490 GIGGIT---GGCCACGGCAAAACAICCGGGICGAAIGCCGGGTICCCGGCGGTGAIGAIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            359 AsnProTyrLeuAlaPheSerAlaIleIleAlaAlaGlyIleSerGlyIleGluGluLy8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                277000 bp DNA linear BCT 11-FEB Streptomyces coelicolor A3(2) complete genome; segment 6/29. AL939109 AL031541 AL036811 AL096849 AL132648 AL137778 AL157953 AL499607 AL590507 AL645882
                                                                                                                                                                  3433 AACCAGTACCTGGCGGTGGCGGCTCTCATTGCTGGAGGGTTGTACGGTATCGAGGGGC
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                                                         CysHisIleHisMetSerLeuGlnAspAlaGluThrGluLysAsnAlaPheTyrAspGln
                                                                                                                                                                                                                                                                                                           319 LeuThrPheAlaProThrLysCysCysTrpAlaIleAspAsnArgThrSerAlaPheArg
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Streptomyces coelicolor A3(2)
Streptomyces coelicolor A3(2)
Bacteria; Actinobacteria; Actinobacteridae; Actinomycetales;
Streptomycineae; Streptomycetaceae; Streptomyces.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          439 SerLysGlnValThrAspTrpGluLeuAsnGlnGlyPheAsnArg 453
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Bentley, S.D.
Direct Submission
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AUTHORS
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KEYWORDS
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      GLUTAMINE SYNTHETASE FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3 IleThrTyrAspGluLeuAsnAsnLeulleArgAsnGlyLysIleAspThrValValLeu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AlaCysValAspMetGlnGlyArgLeuMetGlyLysArgLeuThrGlyArgHisPheLeu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CTGAACACGGTGCCCGGCTATGCGATGGCGTTGGGATGGGACACCGGCTACGGCGATATGGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LeuCysAlaAspLeuAsnSerLeuHisLeuLeuProTrpSerGluGlyAlaValLeuAla
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ATCGCCGAC---CTGGTCTGGGCCGACGCGAGGTCGCCGTCTCGCCGCGCAGCATT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LeuMetGlnGlnIleGluArgLeuAlaAsnLeuLysLeuLysGlyLeu-----Phe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CTGCGCCGTCAGCTCGATCGG------CTCAAGGCGCGCGCGCACTGGTCGCCGATGTG
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                                                                                                                                                                                                                                                                                                                                   Matches:
Conservative:
Mismatches:
Indels:
      TO THE
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        BELONGS
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799.50
58.02%
38.68%
33.65%
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Query Match:
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/Joce="SCEG.06c, hypothetical protein, len: 152 aa;
Joce="SCEG.06c, hypothetical protein, Becherichia coli
Bimilar to SW YBGC ECOLI (EMB: M16489) Escherichia coli
hypothetical 15.6 Kp protein in Cyd8-Tol0 intergenic
region YBGC, 134 aa; fasta scores: opt: 140 z-score: 193.8
E(): 0.0023; 26.7% identity in 116 aa overlap"
                                                   /translation="MPASPSTARAINDRLALHLLQREGPLTAGQLKQLTGLSRPTVAD
LVERLTASGLIEVAGESGEQRRGPNAKLYGIVAERAYLAALDVRTEGVAVLVSDLLGR
                                                                                                                                               STGLPEWHRRLMAALQEKFPEARVGVENETNLAALAEQRDGAARDRDTFVLLWLGGI
GAAVVLDGTLRRGVSGGAGETGFWPVGTAGLPSATDCDGGFRSVAGAAAVTALLAAEH
GVTRAFPAGFEPHAAALVREX/RRSASGSDPAAERFLDALADRYVLLGAAAVVLDPGC
LVLAGEIGRAGADALADRVQHRLTRNSPLATEVRPSTLGGGAVLRGALLTARDRAQDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /translation="MNTGTYGRREVRHARYAVAAVFAVHGSVTGSFATRVPWIODHAG
VSAGQLGIALAFPALGASLAMPLAGRVTHRFGARAALRGLLALWTLALALPSLAPNLL
TLCLALFVYGATAGMSDVAMNALGVEIETRLDKSIMSGLHGWMSTGALIGSAAGTLAA
                                                                                                             VLAEASVPIDDHSGTGPAVEQAVSLVERAVKEAGADRLHTVGIGAPGLIDPAGGELRD
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CAVPRAGASLDWSAVYLRDBLBFTSAGLAACTTGFTLTWARTALGGWYNDREGANVT
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GVATITYTSGLVAPSAIGGLAQATSLVVSFGLVTLLACCLVVPARVLRAGDRNRPRIS
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WTELWAGHGVRFEGDWEAAGDACNAVRELTIGYEAPVTRPGAYAVHLWLDRLGTTGLT
YGFRFCSADGATTYARGTRVLVRLDARTLRPAPWSEAFRTAGRALLRPAD"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             radiodurans transport protein, putative DR2562, 471 aa; fasta scores: opt: 697 z-score: 761.8 E(): 0; 39.0$ fladentity in 359 aa overlap and to SW:MOSC RHIME (EMBL:L17071) Phizobium meliloti membrane protein MoSC, 407 aa; fasta scores: opt: 496 z-score: 552.3 E(): 2.4e-23; 31.0$ identity in 378 aa overlap. Contains match to Prosite entry PS00217 Sugar transport proteins signature 2. Contains also possible hydrophobic membrane paraming regions"
                                                                                                                                                                                                                                                                                                                                            'gene="SCO1447"
'note="Pfam match to entry PF00480 ROK, ROK family, score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2766. .3977
/gene="SCO1448"
/note="SCL6.05, probable transport protein, len: 403 aa;
similar to TR:AAF12043 (EMBL:AE002079) Deinococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gene="GC01450"
/note="SCL6.07, probable uracyl permease, len: 478 aa;
similar to TR:BAA35783 (EMBL:D90738) Escherichia coli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note="PS00217 Sugar transport proteins signature 2" complement(3937. .4395)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /codon_start=1
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /transl_table=11
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complement (3937. .4395)
/gene="SCO1449"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              'note="synonym: SCL6.05"
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                                                                                                                                                                                                                                                                                                             complement (1934. .2104)
                                                                                                                                                                                                                                                                                                                                                                                                             45.80, E-value 1.5e-12" complement (2662. .2667)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2766. .3977
/gene="SC01448"
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/gene="SCO1448"
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/gene="SCO1450"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GGSGLDAALAGVDTVVHCATTQRGGDERSAANIJAAARRAGATHLVYISIVGVDRVPL
GYYRSKYAVEKLVAESGIGWTVLRATQFHDLVVQMLRALAKLPVVVLPAHASDQPVEV
AEVADRLAELAQGAPAGRVPDMGGPEVRTFASLARAYLGATGRRRAVVNVPLAGRTYR
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ATMERRLVLTSPVACPDSSVARLLFHARHLEPLSAGGAAGFWAPLGTAVLLPTVLGWP
AADGTAFAEPGSAGTGRRPG"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="SCL6.02, hypothetical protein, len: aa, similar to various hypothetical proteins, e.g. TR:CAB52558
(EMBL:AL10950) Streptomyces coelicolor hypothetical 25.2 kD protein, SC42.42, 242 aa, fasta scores: opt: 42 z-score: 482.7 E(): 1.8e-19, 39.9% identity in 218 aa coelicolor hypothetical protein SCK13.32c, 263 aa, fasta scores: opt: 11 Z-score: 779.3 E(): 8.9e-36; 49.407% identity in 253 aa overlap."
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/gene="SCO1446"
/note="SCL6.03, possible integral membrane protein, len:
122 aa. Contains possible hydrophobic membrane spanning
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Submitted (09-MAY-2002) Submitted on behalf of the Streptomyces sequencing team, Sanger Institute, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 15A E-mail: schoesnger.ce.uk
On or before Oct 29, 2002 this sequence version replaced
gi:20520886, gi:20520900, gi:20520927, gi:20520938, gi:20520939,
gi:20520886, gi:20520914, gi:20520916.
Location/Qualifiers
1. 277000
| /organism="Streptomyces coelicolor A3(2)" | /mol type="genomic DNA" |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /product="conserved hypothetical protein SCL6.02"
/protein_id="CAB78867.1"
/db_xref="GI:7209205"
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protein id="CAB76868.1"
db_xref="GI:7209206"
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complement(1454..2653)
/gene="SCO1447"
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226. .993
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/gene="SCO1447"
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transl_table=11
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/gene="SC01446"
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                         182 ThrPheMetArgSerValArgAsnLysLeuGluGluAlaGlyIleLeuMetGluAlaThr
                                                                                                         183466 AAGGCGAGTGCAACCCCGGCCAGCAGATCGCCTTCCGCTACGACGAGGCCCTGGTC
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                                                                                                                                                                                             MetValAlaThrPheMetAlaLysLeuSerSerThrAlaLeuGlyAsnAlaCysHisIle
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Streptomyces avermitilis genomic DNA, complete genome, section
27/30.
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Shinose,M., Takahashi,Y., Horikawa,H., Nakazawa,H., Osonoe,T.
Kikuchi,H., Shiba,T., Sakaki,Y. and Hattori,M.
Genome sequence of an industrial microorganism Streptomyces
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Streptomyces avermitilis MA-4680
Bacteria; Actinobacteria; Actinobacteridae; Actir
Streptomycineae; Streptomyces
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TYWPQDQWTALFVWLFTGLAVVCERGFWSRIAIFLGLVFGYVLSWALDRIFGKIHSVD
GSGKPTDHWRLDFSAVGQADWIGLPSPHGPSPEWSAILVALPVVIALIAENAGHVKAV
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AGFALLFGLCPKFGAVVAAIPGGVLGGITVILYGMIGLLGAQIWINAKVDMRNPLNLV
PAAAGIIIGVGNVSMEFTDTFSLSGIALGTLVVITGYHALRAFAPAHLKTQQPLLDEG
                                                                                                                                                                                                                                                                        /db_xref="G1:7209210"
/translation="MDLGVRWKLHGDGKVPAPGAVVRPDERLSWPRTAGLGAQHVVAM
                                                                                                                                                                                                                                                                                                                   FGASFVAPVLMGLDPNLAIMMSGVATVIFLLATRGRVPSYLGCSLSFVGVAAVIRAQG
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uracil transport protein PyrP, 442 aa; fasta scores: opt: 908 z-score: 949.9 E(): 0; 43.1% identity in 429 aa overlap and to SW:PYP BACCL (EMBL:X76083) Bacillus caldolyticus uracil permease (uracil transporter) PyrP, 432 aa; fasta scores: opt: 770 z-score: 806.6 E(): 0; 33.0% identity in 437 aa overlap. Contains Pfam match to entry PF00860 xan ur permease, Xanthine/uracil permeases family. Contains also possible hydrophobic membrane spanning regions"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      184054 GAGGAACTGCACGCCCTCGTCGCCGCCGGTGACATCGACACCGTCGTCCTCGCCTTCCCC
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Matches:
Conservative:
Mismatches:
Indels:
Gaps:
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798.50
57.52%
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Best Local Similarity:
Query Match:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       'translation="MPETDPDLGARLVRHHTIYSCVMGSRAFGLATDGSDTDRRGVFL
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complement (3311. .3775)
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'transl_table
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/gene="aroH"
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3 (bases 1 to 298550)

Shinose, M. Takahashi, Y., Horikawa, J., Hanamoto, A., Takahashi, C., Takahashi, Y., Horikawa, H., Nakazawa, H., Osonoe, T., Kushida, N., Director-General of Biotechnology Center, Shiba, T., Sakaki, Y. and Hattori, M.

Direct Submission

L. Submitted (29-MAR-2002) Director-General of Biotechnology Center, National Institute of Technology and Evaluation, Biotechnology Center; 2-49-10 Nishihara, Shibuya-ku, Tokyo 151-0066, Japan (E-mail: biodenite-go-jp, URL:http://www.bio.nite-go-jp/, Tal: 31-3-3481-1931, Fax: Bl. 3-3481-8424)

This work was done in collaboration with Haruo Ikeda(*1), Jun Ishikawa(*2), Akiharu Hanamoto(*3), Chiqusa Takahashi(*3), Mayumi Shinose(*3), Hiroshi Horikawa(*3), Hidekazu Nakazawa(*4), Tomomi Osonoe(*4), Norihiro Kushida(*4), Hisashi Kikuchi(*4), Tadayoshi Shibo(*5), Yoshiyuki Sakaki(*6,*7), Masahira Hattori(*1,*7)

Final finishing process and all annotation were done by H. Ikeda and J. Ishikawa
                                                                                                                                                                                          Ikeda, H., Ishikawa, J., Hanamoto, A., Shinose, M., Kikuchi, H., Shiba, T., Sakaki, Y., Hattori, M. and Omura, S.
Complete genome sequence and comparative analysis of the industrial microorganism Streptomyces avermitilis
Nat. Biotechnol. 21 (5), 526-531 (2003)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     *1 Kitasato Institute for Life Sciences, Kitasato University *2 National Institute of Infectious Diseases
                                                                      Proc. Natl. Acad. Sci. U.S.A. 98 (21), 12215-12220 (2001) 21477403
avermitilis: deducing the ability of producing secondary metabolites
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         *3 The Kitasato Institute
*4 National Institute of Technology and Evaluation
*5 School of Science, Kitasato University
*6 Institute of Medical Science, University of Tokyo
*7 RIKEN, Genomic Sciences Center
Pollowing url is also available.
http://avemiciis.ls.kitasato-u.ac.jp.
Location/Qualifiers
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                                                                                                                                                                                                                                                                                                        AAGGGCGAGTGCAACCCCGGCCAGCACGAGATCGTGTTCCGGTACGACGAGGCCCTGGTC 239338
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                                  ccctgctgcgccgcatccgcaacgagatgcaggcgcgcggggcctcaccgtcgagtcggcc
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                LeuMetGlnGlnIleGluArgLeuAlaAsnLeuLysLeuLysGlyLeuPheAlaSerGlu
                                                                              LeuGluPheAsnLeuPheAsnGluThrTyrLysSerAlaSerGlnLysHisTrpLysAsn
                                                                                                                                           LeulysThrAlaGlnProHisHisGlnTrpMetAsnIleSerAlaSerSerGlyIleGlu
                                                                                                                                                                         crcacacceeccaaccagracaacarceacracreegegecegegegegegacegarceaa
                                                                                                                                                                                                           ThrPheMetArgSerValArgAsnLysLeuGluGluAlaGlyIleLeuMetGluAlaThr
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                                                                                                                                                            producE="putative prephenate dehydrogenase"
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db_xref="GI:29610185"
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175
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Matches:
Conservative:
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                      PheAsnLeuPheAsnGluThrTyrLysSerAlaSerGlnLysHisTrpLysAsnLeuLys 163
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                                                                                    829 AGTTCTTCGGACATC-----ATGGGTGAAGTTCGCAAGTACATGCGTGATGCGGGA
                                                                                                                                                                                                                    IleLeuMetGluAlaThrHisProGluPheLeuProSerGlnHisGluLeuAsnPheVal
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Pseudomonas sp. KIE171 species isopropylamine degradation gene cluster (ipuABCDEFGH genes), strain KIE171.
AJ311159 AJ311159.1 GI:15865461
gamma-glutamyl-L-1-hydroxyisopropylamide hydrolase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1588 AAAGTTTGGGAGATTAAACAGTCCAATAGTTTCGTGAATAATTGGGAGTTG 1638
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                                                                                                                     CCGGTGGAAAAGAGCGGGCACTGCTACAGCATGCTCCATCAC-----
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YKVSPBELARPLAASLEERAGI FRESEMARVI FPNEFVBHYAQMKVWEIKQSNSFVNNM
                                                                                                                Leisinger, T., van der Ploeg, J., Kiener, A.M., de azevedo Waeech, S.I. and Maire, T. Method för the biotechnological production of 1-alaninol Patent: WO 0173038-A 6 04-OCT-2001; Lonza AG (CH)
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Matches:
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Mismatches:
Indels:
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                                                                                  Bacteria; Proteobacteria.
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Best Local Similarity:
Query Match:
DB:
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gamma-glutamylisopropylamide synthetase; ipuA gene; ipuB gene; ipuC gene; ipuD gene; ipuB gene; ipuB gene; ipuB gene; ipuB gene; putative aldehyde dehydrogenaşe; putative cytochrome P450; putative Ferredoxin; putative permease; putative reductase.

Pseudomonas sp. KIE171

Pseudomonas sp. KIE171
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de Azevedo Waesch, S.I.
Direct Submission
Submitted (03-MAY-2001) de Azevedo Waesch S.I., Microbiology, Swiss
Federal Institute of Technology Zurich, Schmelzbergstrasse 7, 8092
Zurich, SWITZERLAND
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Transformation of isopropylamine to L-alaninol by Pseudomonas sp. strain KIE171 involves N-glutamylated intermediates
Appl. Environ. Microbiol. 68 (5), 2368-2375 (2002)
                                                                                                                                                                                                                                              de Azevedo Wasch, S.I., van der Ploeg, J.R., Maire, T., Lebreton, A.,
                                                                                                                                                                   Bacteria; Proteobacteria; Gammaproteobacteria; Pseudomonadales;
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I (bases 1 to 128136)
Larbig,K.D., Christmann,A., Johann,A., Klockgether,J., Hartsch,T., Merkl,R., Wiehlmann,L., Fritz,H.J. and Tummler,B.
Gene Islands Integrated into tRNA(Gly) Genes Confer Genome Jucreity on a Pseudomonas aeruginosa Clone
J. Bacteriol. 184 (23), 6665-6680 (2002)
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                                                               3340 ATCGTACTAGAAGCGACGAACAGTGAACACGGCCTGGCCAGTACGAGATCAACATCAAG
                                                                                                                                                                                                                                                                           GlyAsnAlaCysHisIleHisMetSerLeuGlnAsp---AlaGluThrGluLysAsnAla
                                                                                                                                                                                                                                                                                                                                                                               3814 GGCGCGATACCAACCCGTATCTGGTTATTGCGGCAAGCCTATTGTCGGGCCTCTATGGC
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                                          196 IleLeuMetGluAlaThrHisProGluPheLeuProSerGlnHisGluLeuAsnPheVal
                                                                                                                    216 ProAlaAspProLeuThrMetAlaAspArgHisIleIleAlaLysHisGlyValArgGlu
                                                                                                                                                         3400 TATGACGATGCGCTCAAGGCAGCGATGATGCAATTTTTGTTAAAAACGCATCAAGGAA
                                                                                                                                                                                                  MetalaGluGlnSerGlyMetValAlaThrPheMetAlaLysLeuSerSerThrAlaLeu
                                                                                                                                                                                                                                                                                                    PheTyrAspGlnAsnAspGluTyrGlyMetSerThrLeuAlaArgAsnTrpIleAlaGly
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ELGGKEVN II.TASYGD1EKAAVASAESMFNNGGEVCIAPSRLIVERSTHKRVVBIVAE
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insertion sequence is flanked by inverted repeats and
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /translation="MLPGRKVKSLSDEITNYLSALMSGQPIQFRVDSLINQHPDLVBC
LEDIQGKWIDQQSGLAPSEPESTSDELAANLRSCLLNAQAEISYLRHELESSRSLLDE
ASHELESYRAREIIMDLYGYLTGGYWELIVIDGDIDNPANTRFSKQPRELIGYSTE
EELDGWDSYVSIVHPDDLKRVIKALDDYARIGHPSPSYVYBRKKIKGDTWYREKG
RGYQDPSGQLWRIIGALRDISDEKLAEAMHARELENIQATYGQISKVYGAIKGTADQT
NMLALNAAIEAARAGDVGRGFSVVADEVKKLAGRTREATQKIQEMLSDSKAF"

COMPLEMENT (21066. 21818)
                          SKDFRHIKQMMYATPEVLHALLDKLAQTVTGYLNEQIRSGVQAVQIFDTWGGVLSGPL
YLEFSLRYMKQIVDGLIRESEGRRVPVILFTKNGGQWLEAMAEAGADALGLDWTTNID
DARRRIGDRVALQGNLDPGALYAPTKRIRAEVADILLARFGSGSGHVFNLGHGIHQYVD
IRTETEVADLTVPDAASDLGYVLAAVKEIRSALAGRVPLIGFSGSPWTLATYMVEGGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="originally longer protein; the integration of an IS-element disrupted the CDS (ORFs SGB and SGS)."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            contains a transposase and a NTP-binding protein, upon insertion into ORF (SGS and SG8) a sequence of 7 bp (CCTTAGT) was duplicated"
/evidence=not_experimental
22070. 24477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           22083. .22137
/note=repeats L1 and L2 are inverted with respect to
and R2 found in the repeat region at the other end of
insertion sequence"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /evidence=not_experimental
/trans1_table=11
/product="hypothetical_protein_with_methyl-accepting
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    22070. 24477 // Anote="located on the gene island PAGI-3(SG)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /rpt_type=direct
22077. .22104
fores="terminal IR of insertion sequence"
frpt_type=inverted
22083. .22137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /insertion seq="IS21 family member"
22070. .22076
/note="flanks insertion sequence"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      domain of chemotaxis transducer"
/protein id="AAN62226.1"
/db xref="G1:24461657"
                                                                                                                                                                                                                                                                                   experimental
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement (21066. .21818)
/gene="ORF SG5"
                                                                                                         PEVVKVFVDAVHELSKPYH"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /rpt_type=direct
                                                                                                                                                                                                                                                                                                              transl_table=11
                                                                                                                                         19225. .19680
/gene="ORF SG3"
19225. .19680
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /gene="ORF SG4"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       20010. .20996
/gene="ORF SG4"
                                                                                                                                                                                                                            gene="ORF SG3"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /gene="ORF SG5"
                                                                                                                                                                                                                                                         codon start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               codon_start=1
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                                                                                                                                               gene
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="bacteriophage P4 integrase subfamily; similar to
Xylella fastidiosa XF1718 (int) and Pseudomonas aeruginosa
C ORF C1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ELLRKIRCYRGNI TTOLGI RLLLLTGVRTGELRLATPDQFDLERGLWI I PPEVVKQLQ
DGWRKRGKR PQDI PPYI VPLSVQAI EI VRYLLEQVKPAQRHLLAHRGDLKKRI SENTL
NAALRRMGYEGLLTGHGI RGTLSTGLNEI GYPKI WVDAQLSHADPNKVSATYNHALYV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        translation="MALTDVAVRQARPTGKDYTLPDFDGLSLAVSAKGGKSWHFRYYW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAKOKRMSLGTYPAVSLREARALRDBARALAAKGINPKVDRKHKLRAVRLATENSFKA
VYLOWLAHRRLELKEGROSTLSQIORI FDKDVLPPLGTVTI FDIRRSNLLDVLATIEQ
RGAFTTAEKVRTWFROLFRFAMVKAEGLVGNPASDLDVVAAPKPPVAHNPFLRLHELP
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Fordict="LENA-Glu"
| Product="LENA-Glu"
| Fordict="LENA-Glu"
| Fordict="LENA-Gly"
| Fordict="LENA-Gly"
| Fordict="att L site; flanks Pseudomonas aeruginosa SG17M
| Gene island PAGI-3(SG); 24 terminal nucleotides of the 3'
                                                                                                                                                                                                                                                                                                                                                                                                                                                     1. .15865
/note="corresponding genomic region to Pseudomonas
aeruginosa PAO1 from gene PA2836 to gene PA2820 with an
average nucleotide substitution rate of 0.27%; all
annotated genes are conserved and show only a few amino
  larbig, K.D., Christmann, A., Johann, A., Hartsch, T., Merkl, R., Klockgether, J., Fritz, H.-J. and Tuemmler, B. Direct Submission Submitted (30-OCT-2001) Klinische Forschergruppe, Medizinische Hochschule Hannover, Carl-Neuberg-Strasse 1, Hannover 30623,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /rpt_rype=direct
15866. .119169
/note="Pseudomonas aeruginosa SG17M gene island
Phote="Pseudomonas aeruginosa SG17M gene island
15907. .15934
/note="AT-rich"
                                                                                                                                                                                                                                                                                                                                                                      /map="between genes PA2836 and PA2815"
/clone="C"
/note="hypervariable genome region"
                                                                                                                                                                                                                                                            organism="Pseudomonas aeruginosa"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /product="putative integrase"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /evidence=not_experimental
/transl table=11
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                                                                                                                                                                                                                                                                                 /mol_type="genomic DNA"
/strain="SG17M"
/db_xref="taxon:287"
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                                                                                                                                                                                                    Location/Qualifiers
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16091..17500
/gene="int"
/note="ORF SG1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /gene="hemE"
/note="ORF SG2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      codon_start=1
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gene="int
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AUTHORS
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                                                                                        TITLE
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33230 CTCCTGCGCAAAGCAAACAAAAGCAGAGCAGCTTGGCTACAAGTGCCACGCGGCTTAC 33289
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                                                                                                                                                                                                                                                                                                                                                                                                                                                       212
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AsnAlaAlaAsnValGluIleAsnGluPheSerLysGlnValThrAspTrpGluLeu 447
                                                                                                                                                                                                                                                                                                                               173 AsnileSerAlaSerSerGlyIleGluThrPheMetArgSerValArgAsnLysLeuGlu
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-----TCTAGITCTTCGGACATC-----ATAGGIGAAGITCGCAAGIACCATGCGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      33446 GATGCCGGGATCGTACTAGAGGCGACGAACAGTGAACATGGCCCGGGCCAGTACGAGATC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          33506 AACATTAAGTATGACGATGCGCTCAAAGCAGCGGATGACGCAATTTTTGTGAAAAACGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              33626 GAGTGGTCGGTCGTCCGGTCATGTCCACATTAGTCTGTCGAACTTAATAACAGGTGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             33926 ATCCCTGGTGCCGATACCAACCCTTATCTGGGTTATTGCGGGCCAGCCTCTTGTCGGGTCTC
                                                                                            GluLeuGluPheAsnLeuPheAsnGluThrTyrLysSerAlaSerGlnLysHisTrpLys
                                                                                                                                                                                                                                                                                                                                                                                                                                                    193 GluAlaGlyIleLeuWetGluAlaThrHisProGluPheLeuProSerGlnHisGluLeu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AsnPheValProAlaAspProLeuThrMetAlaAspArgHisIleIleAlaLysHisGly
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           233 ValArgGluMetAlaGluGlnSerGlyMetValAlaThrPheMetAlaLysLeuSerSer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            253 ThrAlaLeuGlyAsnAlaCysHisIleHisMetSerLeuGlnAspAlaGluThrGluLys
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 273 AsnAlaPheTyrAspGlnAsnAspGluTyrGlyMetSerThrLeuAlaArgAsnTrpIle
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AlaGlyLeuLeuLysTyrValProGluAlaThrTyrPhePheAlaSerTyrIleAsnSer
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              353 IleGlyGlyAlaAspLeuAsnProTyrLeuAlaPheSerAlaIleIleAlaAlaGlyIle
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       33986 TATGCCATCGAGAACAAACTCAAGCCGAAAGACCCCATCCTCGGTAACGCTTAC----
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AP005021 300550 bp DNA linear BCT 10-MAY-Streptomyces avermitilis genomic DNA, complete genome, section 1/30 AP006021 BA000030
                                                                                                                                                                                                                                                  33350 AGCATTAATCCAGTGGAAAAGAGTGGCCACTGCTACAGCATGCTCCATCAC
                                                                                                                                                                                                          161 AsnLeuLysThrAlaGlnPro---
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          33068 GATGGATTGGCGTTTACTGGTTGG-------GATTCCGGGTATCCGGATATT 33112
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RKMFVVAYPRETQEMVLDAHNRAFAFFGGVPQRVIYDNLKTAVDAILVGKDRIFNRF
LALANHYLFEPVACTPAAGWEKGQVENQVGNIREWLFTPLARFASFADLNHWLATRCQ
ELAQRKHPFERSRSIAECFVQEQAHLRVIDAPFDGYVEQMRSVSSTCLVRVDRNQYSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PAQWAGKVTSVRCTADEIRIVADDQLIARHARRFGRDQLVYDPWHYLAVLDKKPGALR
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           translation="MISMDIIAEIRRRHLVSGETISVIARSLNLSRPTVRKHLRSTTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LUKQWKALKTRPGAAQAFIPLLFAPGEACQFDWSHEQAEIAGVMQTIKVAQFRLCHS
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9
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Matches:
Conservative:
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                                                                                                                                                                                                                                                                                                                                                                                                                  product="putative transposase"
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svidence=not_experimental
transl_table=11
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22117. .22137
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                                                                            /note="L2"
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22083. .22103
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gene="istA"
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gene="istB"
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Best Local Similarity:
   repeat_region
                                                                                         repeat_region
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QwQasnablereawprdbhirelselefietispesidsherpsigigglogglobyypti
Avaplolinhlabdatirecametcrrhfyrqrgraanggurtsgikyctrecaraqa
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YGOTMDGFDLAVVDEAHSTTGDLGRPWAAIHDNSRIPADFRLYLTATPRILASPRPQK
GADGRELEIATWASDPDGPYGEWLPELGLSEAVERGILAGFEIDVLEIRDPSPALGES
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BAELVDAGALDESSIGAEFYELEAGRHYPDDRYMAAMLGGBHLVAREREVLRQFADGL
DAGAIKRVHRAFLASYRVLGEGVDI VGERGVBRICFADTRGSQVEI VONIGRALRPPPD
GTINKTARII VPVFLQPGENFTDMVASASFAPLVTVLQGLRSHSERLVEQLASRALTSG
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PESLVWLEGYQALLRWRKKNHITGLYAVPYDTETEAGVTKAFPLGRWVHQORRTYRAG
ELDPHRTTLLDEAGMVWEPQDEAWENKLAALRSFHRAHGHLAPRRDAVWGDADSELVP
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HSRLPDIQPGVQFEGDDLGKWLQRQRRSWAELSEEQQQRLTALGVTPAEPPTPTPSAK
GGGKAAAFQRGLAALAQWIQREGAHKVVPRGHVEAVVIDGQEHQHKLGVWISNTKTRR
                                                                                                                                                                                                                                                                                                                                                                                                                                                 RRYRITVPRRNAIMRPQRDVCALCOEGPPTDHCPDAVSFWHIDHDHRCCPPGGSCGRC
VRGILCLEVRATRLPAYERLPWLRDSPRFNTYLNSPPARHPEARPTARDHAGPRDAS
SYLIDAFFTAADHPGRALGS!
complement (3433. .3939)
                                                                                                                                          /tränslation="MPPQGARGTIVSATGSGKTSMAAASTLNCFPEGRILVTVPTLDL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                OREHRRRRKQQTTTLQQPPAPGPQSHDTSEPTAEGR"
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Shinose, M. Takahashi, Y., Horikawa, H., Nakazawa, H., Osonoe, T., Kushida, M., Director-General of Biotechnology Center, Shiba, T., Sakaki, Y. and Hattori, M. Director-General of Biotechnology Center, Shiba, T., Sakaki, Y. and Hattori, M. Director-General of Biotechnology Center, Shiba, T., Submitted (29-MAR-2002) Director-General of Biotechnology Center, Submitted (29-MAR-2002) Director-General of Biotechnology Center, National Institute of Technology and Evaluation, Biotechnology Center; 2-49-10 Nishhara, Shibuya-ku, Tokyo 151-0066, Japan (E-mail:blo@mite-go.jp, WRL:http://www.bio.nite-go.jp/, This work was done in collaboration with Haruo Ikeda(*1), This work was done in collaboration with Maro Ireda(*1), Mayumi Shinose(*2), Akiharu Hanamoco(*3), Chigusa Takahashi (*3), Mayumi Shinose(*3), Hiroshi Horikawa(*4), Hidekazu Nakazawa(*4), Tomomi Osonoe(*4), Norihiro Kushida(*4), Hisashi Kikuchi (*4), Tadayoshi Shinos Satoshi Omura (*1,*3).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ikeda,H., Ishikawa,J., Hanamoto,A., Shinose,M., Kikuchi,H.,
Shiba,T., Sakaki,Y., Hattori,M. and Omura,S.
Complete genome sequence and comparative analysis of the industrial
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*! Kitasato Institute for Life Sciences, Kitasato University
*2 National Institute of Infectious Diseases
*3 The Kitasato Institute
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NCIMB 12804 or NRRL 8165.~synonym: Streptomyces
                                                                                                                                                                                                         Omura, S., Ikeda, H., Ishikawa, J., Hanamoto, A., Takahashi, C., Shinose, M., Takahashi, Y., Horikawa, H., Nakazawa, H., Osonoe, T., Kikuchi, H., Shiba, T., Sakaki, Y. and Hattori, M. Genome sequence of an industrial microorganism Streptomyces avermitilis: deducing the ability of producing secondary
                                                     Straptomyces avermitilis MA-4680
Straptomyces avermitilis MA-4680
Bacteria, Actinobacteria, Actinobacteridae, Actinomycetales,
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*5 School of Science, Kitasato University
*6 Institute of Medical Science, University of Tokyo
*7 RIKEN, Genomic Sciences Center
Pollowing url is also available.
http://avermitilis.ls.kitasato-u.ac.jp.
1. 300550
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                                                                                                                                                   Streptomycineae; Streptomycetaceae; Streptomyces,
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Nat. Biotechnol. 21 (5), 526-531 (2003)
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/note="SAV2"
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227991 ACCAAGCTGCCCGGCGGACCGGAGATGTGCGCCTACATCCTGGCGACAGACGTGGACATG 228050
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                                                                                                                                                               IleThrTyrAspGluLeuAsnAsnLeuIleArgAsnGlyLysIleAspThrValValLeu
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Matches:
Conservative:
Mismatches:
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421 GluLysLeuIleLeuHisTyrValAsnAlaAlaAsnValGluIleAsnGluPheSerLys 440

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82
                                                                                                                                                                                                                                                                                                                                                                                          228051 AACCCGCTGGACGGGTTCGAACTCGCCGGCTGGCACACCGGATACGGAGACCTGCGTGTC
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229109 ACACCCGTAGTGCACTACGCCCGCGTGCCAAGGTTGAGATCGAGGACACGCC 229168 g G

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Search completed: December 18, 2003, 00:54:26 Job time : 6869 secs

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GenCore version 5.1.6

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OM protein - protein search, using sw model

Run on: December 17, 2003, 22:42:10; Search time 19 Seconds

(without alignments)
2297.925 Million cell updates/sec

Title:
US-10-098-602A-2
Sequence: 1376
Sequence: 2376
Gapop 10.0, Gapext 0.5

Scoring table: BLOSUM62
Gapop 10.0, Gapext 0.5

Searched: 283308 seqs, 96168682 residues

Total number of hits satisfying chosen parameters: 283308
Minimum DB seq length: 0
Maximum DB seq length: 0
Maximum Maxch 0%
Maximum Maxch 100%
Listing first 45 summaries
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Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

PIR 76:*
1: pir1:*
2: pir2:*
3: pir3:*
4: pir4:*

Database :

iption	glutamine syntheta probable glnA4 propubable glnA4 propubable glutamine syntheta glutamine syntheta glutamine syntheta glutamine syntheta conserved hypotheta glutamine synthase glutamine synthase glutamine synthase glutamine probable glutamine probable glutamine probable glutamine probable glutamine probable glutamine glutamine syntheta glutamine syntheta glutamine syntheta glutamine syntheta glutamine syntheta glutamine syntheta glutamine syntheta glutamine syntheta glutamine syntheta glutamine syntheta glutamine-ammonia glutamine-ammonia glutamine-ammonia glutamine-ammonia glutamine-ammonia glutamine syntheta glutamine syntheta glutamine syntheta glutamine syntheta glutamine syntheta glutamine syntheta glutamine syntheta
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SUMMARIES ID	AF2839 H97616 F708585 F708685
DB	
пg	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
Query Match	133.66.7.7.7.7.7.9.9.9.9.9.9.9.9.9.9.9.9.9.
Score	942.5 942.5 942.5 7799.5 10.5 866.5 966.5
Result No.	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2

glutamine syntheta	glutamate-ammonia	probable glutamine	glutamate-ammonia	glutamine syntheta	probable gln2 - My	glutamine synthase	glutamine syntheta	glutamate-ammonia	glutamine syntheta	glutamine syntheta	glutamine syntheta	glutamine syntheta	probable glutamine	conserved hypothet
AB2600	T45145	C97382	A64468	F69076	B70776	A87113	C75009	T47127	B84359	E69368	H87636	A36911	D71143	D83449
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460	448	452	454	442	446	448	439	454	454	491	465	439	443	454
16.9	16.9	16.8	16.8	16.6	16.6	16.5	16.4	16.3	16.3	16.2	16.2	16.1	15.8	15.8
401.5	400.5	400	398.5	395	393.5	391.5	389.5	387.5	386.5	386	385.5	381.5	376	375
30	32	33	34	35	36	37	38	39	40	41	42	43	44	45

ALIGNMENTS

RESULT 1 AP2839 glutamine synthetase ()Species: Agrobacter (C)Date: 11-Jan-2002 H (C)Date: 11-Jan-2002 H (C)Date: 11-Jan-2002 H (C)Date: 11-Jan-2002 H (C)Date: 11-Jan-2002 H (C)Date: 12-Jan-2002 H (C)Date: 12-Jan-2002 H (C)Date: 12-Jan-2002 H (C)Date: 11-Jan-2002 H (C)Date:	glnA [imported] - Agrobact flum tumefaciens sequence_revision 11-Jan-2 forant, C.; Guenthner, D.; Zhang, S. 2001 ao, Y.; Biddle, P.; Jung, I f the Natural Genetic Engl; E2577; MUID:21608550; PMID strain C58 (Dupont) lar chromosome ate-ammonia ligase
Query Match Best Local Matches 19	Query Match 39.7%; Score 942.5; DB 2; Length 454; Best Local Similarity 43.3%; Pred. No. 5.2e-69; Matches 195; Conservative 89; Mismatches 165; Indels 1; Gaps 1;
	4 TYDELNNLIRNGKIDTVVLACÝDNÝGKLNGKRLTCRHFLGLDQKKISISTFVYAVTIEGI 63
Oy 64	64 AGGGYEISSVDTGYSDCHLCADLNSLHLLPWSEGAVLAISNPHNFVTSEPLFCSPRVILM 123
Oy 124	124 QQIERLANLKLKGLFASELEFNLFNETYKSASQKHWKNLKTAQPHHQWMNISASSGIETF 183
Qy 184 Db 185	184 MRSVRNKLEBAGILMEATHPEFLPSOHELNFVPADPLTMADRHTIAKHGVREMAEOSGMV 243
Oy 244 Db 245	244 ATFWAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLARNWIAGLLKYVPEAT 303
Oy 304	304 YFFASŶINSYKRLOPLTFAPTKCCWAIDNRTGAFRLCNSKSEGINVELRIĜGĀDĪNRYLĀ 363

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454
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Best Local Similarity 43.9%;
Matches 192; Conservative 78
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                                                                                                                                                                                 probable glnA4 protein [imported] - Agrobacterium tumefaciens (strain C58, Cereon)
C;Species: Agrobacterium tumefaciens
C;Species: Agrobacterium tumefaciens
C;Species: Agrobacterium tumefaciens
C;Species: Jo-Sep-2001 #sequence_revision 30-Sep-2001 #text_change 18-Nov-2002
C;Accession: H97616
R;Goodner, B.; Hinkle, G.; Gattung, S.; Miller, N.; Blanchard, M.; Qurollo, B.; Goldman, A.; Liu, F.; Wollam, C.; Allinger, M.; Doughty, D.; Scott, C.; Lappas, C.; Markelz, B.; Science 294, 2323-2328, 2001
A;Title: Genome Sequence of the Plant Pathogen and Biotechnology Agent Agrobacterium tum A;Reference number: A97359; MUD:21608551; PMID:11743194
A;Reference number: A97359; MUD:21608551; PMID:11743194
A;Residues: 1-454 «KUR»
A;Residues: 1-454 «KUR»
A;Residues: 1-454 «KUR»
A;Conserreferences: GB:AE007869; PIDN:AAK87889.1; PID:g15157281; GSPDB:GN00169
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glutamate-ammonia ligase (EC 6.3.1.2) [imported] - Brucella melitensis (strain 16M)
c;Species: Brucella melitensis
C;Species: 01-Feb-2002 #sequence_revision 01-Feb-2002 #text_change 03-Jun-2002
                  364 MAALLAAGIDGIENKLELEPAFVGDAYGGKDVREIPKTLRDATAFLDGSKMLRQAFGDDV 423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   64 AGGGYEISSVDTGYSDCHLCADLNSLHLLPWSEGAVLAISNPHNFVTSEPLFCSPRVILM 123
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39.7%; Score 942.5; DB 2;
Best Local Similarity 43.3%; Pred. No. 5.2e-69;
Matches 195; Conservative 89; Mismatches 165;
                                                                   453
                                                                                      ILHYVNAANVEINEFSKQVTDWELNQGFNR 453
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A,Map position: circular chromosome
C,Superfamily: glutamate-ammonia ligase
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Virtuesini, 1357

Virtuesini, 1357

Virtuesini, M.; Goltsman, E.; Selkov, E.; Elzer, P.H.; Hagius, S.; O'Callaghan, D.; Letess

Proc. Natl. Acad. Sci. US.A. 99, 443-448, 2002

A;Title: The genome sequence of the facultative intracellular pathogen Brucella melitens

A;Reference number: AD3252; PMID:11756688

A;Recession: A13578

A;Recension: A13578

A;Residues: 1-434 «KUR»

A;Residues: 1-434 «KUR»

A;Residues: 1-434 «KUR»

A;Residues: 1-634 «KUR»

A;Cross-references: GB:AE008918; PIDN:AAL53796.1; PID:g17984727; GSPDB:GN00191

A;Genetics: A;Genetics: Gtrain 16M

C;Genetics: A;Genetics: Gtrain 16M

C;Genetics: Gtrain 1998e
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probable glnA4 protein - Mycobacterium tuberculosis (strain H37RV)

C;Species Mycobacterium tuberculosis

C;Date: 17-Jul-1998 #sequence_revision 17-Jul-1998 #text_change 20-Jun-2000

C;Accession: F70885

R;Cole, S.T.; Brosch, R.; Parkhill, J.; Garnier, T.; Churcher, C.; Harris, D.; Gordon, S.; Connor, R.; Davies, R.; Devlin, K.; Feltwell, T.; Gentles, S.; Hamlin, N.; Holroyd, S. Rajandream, M.A.; Rogers, J.; Rutter, S.; Seeger, K.; Skelton, S.; Squares, S.

Nature 393, 537-544, 1998

A;Authors: Sqares, R.; Sulston, J.E.; Taylor, K.; Whitehead, S.; Barrell, B.G.

A;Title: Deciphering the biology of Mycobacterium tuberculosis from the Complete genome A;Reference number: A70800; MUID:98295987; PMID:9634230
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             318 PLIFAPTKCCWAIDNRTSAFRLCNSKSEGINVELRIGGADLNPYLAFSAIIAAGISGIEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 21 VLAC-VDMQGRLMGKRLTGRHFLGLDQKKISISTFVYAVTIEGIAGGGYEISSVDTGYSD
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                                                                                                                                                                                                                                                                                                                                                    LNTVPGYAMASWDTGYGDMVMTPDLSTLRLIPWLPGTALVIAD-LVWADGSEVAVSPRSI 127
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           probable glutamine synthetase - Streptomyces coelicolor C;Species: Streptomyces coelicolor C;Species: Streptomyces coelicolor C;Species: O1-Dec-1999 #sequence_revision 03-Dec-1999 #text_change 21-Jan-2000 C;Accession: T36848 R;Oliver, K.; Harris, D.; Parkhill, J.; Barrell, B.G.; Rajandream, M.A. subjectence number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: DNA A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 221615 A;Reference number: 2216
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                                                                                                                ; Score 799.5; DB 2;
; Pred. No. 2.6e-57;
88; Mismatches 180;
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                 C;Genetics:
A;Gene: glnA4
C;Superfamily: glutamate-ammonia ligase
  source: strain H37Rv
                                                                                                                Query Match 33.6%;
Best Local Similarity 38.7%;
Matches 176; Conservative 8
A; Experimental
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collins synthetase BH3867 [imported] - Bacillus halodurans (strain C-125)
C;Species: Bacillus halodurans
C;Species: D1-Dec-2000 #sequence_revision 01-Dec-2000 #text_change 15-Jun-2001
C;Accession: C84133
R;Takami, H.; Nakasone, K.; Takaki, Y.; Maeno, G.; Sasaki, R.; Masui, N.; Fuji, F.; Hiz Nucleic Acids Res. 28, 4317-4331, 2000
A;Title: Complete genome sequence of the alkaliphilic bacterium Bacillus halodurans and A;Reference number: A83650; MUID:20512582; PMID:11058132
A;Retens: preliminary
A;Redeule type: DNA
A;Residues: 1-455 <270>
A;Cross-references: GB:AP001520; GB:BA000004; NID:g10176401; PIDN:BAB07586.1; GSPDB:GNO
A;Cross-references: strain C-125
C;Genetics:
A;Gene: BH3867
C;Superfamily: glutamate-ammonia ligase
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122 LMQQIERLANLKLKGLFASELEFNLFNETYKSASQKHWKNLKTAOPHHQWMNISASGIE 181
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                                    311 LAVAGLVAAGLHGIEQRLELPEPCPGNAYT-ADFAHVPTTLREAAELWENSTLAXAAFGD
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                                                                                                                                                   MVATEMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDBYGMSTLARNWIAGLLKYVPE
                                                                                                                                                                                                                                                                                                                                                                                          312 FSLLYAPHINSYKRFQPGSFAPTAVAWGHDNRTCALRVV-GHGRSLRFENRLPGGDVNPY
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                                                                                                                 182 TFMRSVRNKLEBAGILMEATHPEFLPSQHELNFVPADPLTMADRHIIAKHGVREMAEQSG
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31.1%; Pred. No. 1.1e-33;
ive 77; Mismatches 187; Indels 57;
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Best Local Similarity 31.1%
Matches 145; Conservative
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Ristover, C.K.; Pham, X.Q.; Erwin, A.L.; Mizoguchi, S.D.; Warrener, P.; Hickey, M.J.; Bradman, S.; Yuan, Y.; Brody, L.L.; Coulter, S.N.; Folger, K.R.; Kas, A.; Larbig, K.; Lim, J., Lory, S.; Olson, M.V.
Nature 406, 959-964, 2000
A;Title: Complete genome sequence of Pseudomonas aeruginosa PA01, an opportunistic patholy. A;Reference number: A82950; MUID:20437337; PMID:10984043
                                                                                                                                                                                                                         A;Accession: C83225
A;Status: preliminary
A;Molecule type: A;Bratus corrections corrections corrections corrections corrections corrections corrections corrections corrections corrections corrections corrections corrections corrections corrections corrections corrections corrections corrections corrections corrections corrections corrections corrections corrections corrections corrections corrections correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly correctly co
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NyAlernate names: glutamine synthetase
Syspecies clostridium acetobutylicum
C;Date: 31-Dec-1989 #sequence_revision 31-Dec-1989 #text_change 03-Jun-2002
C;Accession: A28676; S11994
R;Janssen, P.J.; Jones, W.A.; Jones, D.T.; Woods, D.R.
A;Title: Molecular analysis and regulation of the glnA gene of the gram-positive anaeroi
A;Reference number: A28676; WUID:88086901; PMID:2891680
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A;Residues: 1-443 <JAN>
A;Cross-references: G3:X54158
A;Cross-references: G3:X54158
B;Janssen, P.J.; Jones, D.T.; Woods, D.R.
Mol. Microbiol. 4, 1275-1583, 1990
A;Title: Studies on Clostridium acetobutylicum glnA promoters and antisense RNA.
A;Reference number: S11994; MUID:91141310; PMID:1981087
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            342 SPA---IQGEFEVPEELTLPCTMYDALRRLKGSALARELFGSEFVEGYVATKSMELTSFF 398
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             165 HEMGTSQFEINFLHGDPVLLADQTFLFKHLKEVALKHGLIVVCMAKPLAKTPGSSMHH 224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      263 MSLQDAETEKNAFYDQNDEYGMSTLARNWIAGLLKYVPEATYFFASYINSYKRLQPLTFA 322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      383 PPASGNVYNDKELPE---FPNSLQNATHLLKESKMLNKTFGEKLILHYVNAANVEINEFS 439
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  109 PNTDPNEPFQAPLGPDGRR----ELGYSAFSVSSNNGLRPFFEDVYRCMDALGLVRDTFM
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 413;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ; Score 469; DB 2; Length 413; Pred. No. 2.3e-30; 92; Mismatches 174; Indels
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28.8%;
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Matches 123, Conservative
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Best Local Similarity
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on, D.;
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A;Status: preliminary
A;Moles: preliminary
A;Residues: 1-439 <ARN>
A;Cross-references: GB:AE001758; GB:AE000512; NID:g4981480; PIDN:AAD36024.1; PID:g498148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Nature 399, 323-329, 1999
A;Title: Evidence for lateral gene transfer between Archaea and Bacteria from genome seq
A;Reference number: A72200; MUID:99287316; PMID:10360571
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                                                                                                                                                                                                                                                                                                                                                            glutamine synthetase - Thermotoga maritima (strain MSB8)
C;Species: Thermotoga maritima
C;Species: Thermotoga maritima
C;Species: 11.-1999 #sequence_revision 11-Jun-1999 #text_change 21-Jul-2000 .
C;Accession: B72313
R;Nelson, K.E.; Clayton, R.A.; Gill, S.R.; Gwinn, M.L.; Dodson, R.J.; Haft, D.H.; Hicl
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401
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                                     GIAGGGYEISS-VDTGYSDCHLCADINSLHLLPWS-EGA-----VLAISNPHNFVTSEPL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          42;
                                                                                                                                                                     Length 439;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       73; Mismatches 209; Indels
                                                                                                                                   LQNATHLLKESKMLNKTFGEKLILHYVNAANVEINEFSKQVTDWEL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A Experimental source: strain MSB8
C, Genetics:
A, Gene: TW0943
C, Superfamily: glutamate-ammonia ligase
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Best Local Similarity
Matches 138; Conserv
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A;Status: preliminary
A;Molecule type: DNA
A;Residues: 1-38 <JA2>
C;Comment: This enzyme catalyzes the formation of glutamine from ammonia and glutamic ac
C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 10
AB3575
glutamate-ammonia ligase (EC 6.3.1.2) [imported] - Brucella melitensis (strain 16M)
G'Species: Brucella melitensis
C'Species: Brucella melitensis
C'Species: 01-Feb-2002 #sequence_revision 01-Feb-2002 #text_change 03-Jun-2002
G'Accession: AB375
R'DelVecchio, V.G.; Kapatral, V.; Redkar, R.J.; Patra, G.; Mujer, C.; Los, T.; Ivanova, Mazur, M.; Goltsman, E.; Selkov, E.; Elzer, P.H.; Hagius, S.; O'Callaghan, D.; Letess Proc. Natl. Acad. Sci. US.A. 99, 443-448, 2002
A;Title: The genome sequence of the facultative intracellular pathogen Brucella melitens
A;Reference number: AD3252; PMID:11756688
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                                                                                                                                                                                                                                                                                                                                                                                            112 L----KRANADAKELGYTMNVGPECEFFLFE-----TDENGRATTNTQDKAGYFDLAP 160
                                                                                                                                                                                                                                                                                                                                                                                                                                SSGIETFMRSVRNKLEEAGILMEATHPEFLPSQHELNFVPADPLTMADRHIIAKHGVREM 236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TDLGENARRDMTLALEEMGFEIEASHHEVAEGONEIDFKYGDALTTADNIMTFKLVVKSI 220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AEQSGMVATFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLARNWIAGLL 296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KYVPEATYFFASYINSYKRLQPLTFAPTKCCWAIDNRTSAFRLCNSKSEGINVELRIGGA 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SSNPYLVLACLLQAGLDGIKNNLQPPAEVEANIFAMTEQERKENGIDNLPNNLYEAVNYM 398
                                                                                                                                                                                                                                                                                           64 AGGGYEISSVDTGYSDCHLCADLNSLHLLPW--SEGAVLAISNPHNFVTSEPLFCSPRVI 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PIDN:AAL53765.1; PID:g17984693; GSPDB:GN00191
                                                                                                                                                                                                                           63
                                                                                                                                                                                                                                                             9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      4 TYDELNNLIRNGKIDTVVLACVDMQGRLMGKRLTGRHFLGLDQKKISISTFVYAVTIEGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DLNPYLAFSAIIAAGISGIEEKLELPPPASGNVY-----NDKELPEFPNSLQNATHLL
                                                                                                                                                                                         Gaps
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                                                                                                                                                                                         40;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 476
                                                                                                                                                      19.6%; Score 466; DB 1; Length 443
28.0%; Pred. No. 4.5e-30;
live 84; Mismatches 211; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KESKMLNKTFGEKLILHYVNAANVEINEFSKOVTDWELNOGFNRY 454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         19.6%; Score 465; DB 2; Length 47.
28.7%; Pred. No. 6.1e-30;
iive 71; Mismatches 208; Indels
                                                                                                 Superfamily: glutamate-ammonia ligase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A,Map position: II
C,Superfamily: glutamate-ammonia ligase
C,Keywords: ligase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Cross-references: GB:AE008918; 1
Experimental source: strain 16M
                                                                                                                                                    Query Match
Best Local Similarity 28.01
Matches 130; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local Similarity 28.77
Matches 133; Conservative
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Accession: AB3575
                                                                                 A;Gene: glnA
C;Superfamily: glut
C;Keywords: ligase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gene: BMEII0523
                                                                                                                                                                                                                                                                                                                                                            122
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J.D.; Dodson, R.J.;
T.; Zalewski, C.; M
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               R1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A;Tille: Genome sequence of the radioresistant bacterium Deinococcus radiodurans A;Reference number: A75250; MUID:20036896; PMID:10567266
A;Accession: G75517
A;Cession: G75517
A;Status: preliminary
A;Molecule type: DNA
A;Residues: 1-449 < MHI.>
A;Residues: 1-449 < MHI.>
A;Cess-references: GB:AE001904; GB:AE000513; NID:g6458129; PIDN:AAF10028.1; PID:A;Experimental source: strain R1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               œ
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                                                                                                          GI---AGGGYEISSVDTGYSDCHLCADLNSLHLLPWSEGAVLAISNPHNFVTSEPLFCSP 118
                                                                                                                                                                                                                                                                                                                                                                          189 GRAIGGGGGYSIAGVNEFDELIDDIYHFSEGGGLEIDTLIHEGAGGLEINLRHGDPVEL 248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ---SEGAVLAISNPHNFVTS 111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    112 EPLFCSPRVILMQQIERLANLKLKGLFASELEFNLFNETYKSASQKHWKNLKTAQPHHQ- 170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -WMNISASSGIETFMRSVRNKLEEAGILMEATHPEFLPSQHELNFVPADPLTMADRHIIA 229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                  85
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Species: Deinococcus radiodurans
Date: 03-Dec-1999 #sequence_revision 03-Dec-1999 #text_change 17-Mar-2000
                             28 VKNWKQATEWLAWRDIEDIECITPDQAGVARGKMMPSKKF--TSNTSLALPSAVFMTTIS
                                                                                                                                                                                                                                                       307 SESQAFHHFLGGMQRHVPNALVMFAPYVNSYRRLTPDASAPVNVKWGYDNRTTAFRVPRS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       --- CV--- DMQGRLMGKRLTGRHFLGLDQKKISISTFVYAVTIE
                                                                                                                                                               86 GAYPEDGYĞFHYPEDD----GDLKLLPDLTTLSAVPWETDSTAQVICDLVYQDGRAVEFTP
                                                                                                                                                                                                                                                                                                                                    170 -----QWMNISASGIETFMRSVRNKLEEAGILMEATHPEFLPSQHELNFVPADPLTM
                                                                                                                                                                                                                                                                                                                                                                                                                                                    ADRHI I AKHGVREMAEQSGMVATFMAKLSSTALGNACHIHMSLODAETEKNAFYDQNDEY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 283 GMSTLARNWIAGLLKYVPEATYFFASYINSYKRLQPLTFAPTKCCWAIDNRTSAFRLCNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 343 KSEGINVELRIGGADLNPYLAFSAIIAAGISGIEEKLELPPPASGNVYNDKELPEFPNSL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       glutamine synthase - Deinococcus radiodurans (strain R1)
C;Species: Deinococcus radiodurans
C;Accession: G3-Dec-1999 #sequence_revision 03-Dec-1999 #text_change 17-M
C;Accession: G7517
R;White, O.; Eisen, J.A.; Heidelberg, J.F.; Hickey, E.K.; Peterson, M.; Shen, M.; Vamathevan, J.J.; Lam, P.; McDonald, L.; Utterback, S.; Smith, H.O.; Venter, J.C.; Fraser, C.M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               31;
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                                                                                                                                                                                                                          RVILMOOIERLANLKLKGLFASELEFNLFNETYKSASOKHWKNLKTAOPHH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  403 QNATHLLKESKMLNKTFGEKLILHYVNAANVEINEFSKQVTDWE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 2;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    19.5%; Score 464.5; DB 2 30.9%; Pred. No. 6.1e-30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A;Gene: DR0451
A;Map position: 1
C;Superfamily: glutamate-ammonia ligase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Best Local Similarity 30.99
Matches 126; Conservative
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The Same

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probable glutamine synthetase PA0296 [imported] - Pseudomonas aeruginosa (strain PAO1) C; Species: Pseudomonas aeruginosa (c; Species: Pseudomonas aeruginosa (c; Species: Pseudomonas aeruginosa (c; Species: Pseudomonas aeruginosa (c; Species: C; Species: C; Pham. S; Species: C; Pham. S; Species: S; Stover, C; Pham. X; Erwin, A.L.; Mizoguchi, S.D.; Warrener, P.; Hickey, M.J.; Bradan, S; Yuan, Y; Brody, L.L.; Coulter, S.N.; Folger, K.R.; Kas, A.; Larbig, K.; Lim, Nature 406, 959-964, 2000
                                                                                                                                                                                                                                                                                                                                                                                                                       A;Title: Complete genome sequence of Pseudomonas aeruginosa PA01, an opportunistic pathc
A;Reference number: A82950; MUID:20437337; PMID:10984043
A;Accession: B83609
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A;Status: preliminary
A;Molecule type: DNA
A;Molecule type: DNA
A;Residues: 1-458 <STO>
A;Cross-references: GB:AE004467; GB:AE004091; NID:g9946113; PIDN:AAG03685.1; GSPDB:GN001
A;Experimental source: strain PAO1
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 131 NLKLKGLFASELEFNLFN-ETYKSASOKHWKNLKTAOPHHOWMNISASSGIETFMRSVRN 189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     245
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AIIAAGISGIEEKLELPPPASGNVYNDKELPEFPNSLONATHLLKESKMLNKTFGEKLIL 425
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               16 KIDTVVLACVDMQGRLMGKRLTGRHFLGLDQKKISISTFVYAVTIEG----IAGGGYEIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         190 KLEEA---GILMEATHPEFLPSQHELNFVPA-DPLTMADRHIIAKHGVREMAEQSGMVAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLARNWIAGLLKYVPEATYF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
HNAVKALPEDTIVTEALGEHVLVNFVEAKRIEWASYAQFVSQWEIDNYLELY 446
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19.3%; Score 459; DB 2; Length 45
Best Local Similarity 28.4%; Pred. No. 1.8e-29;
Matches 126; Conservative 82; Mismatches 213; Indels
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C;Superfamily: glutamate-ammonia ligase
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C;Species: Lactococcus lactis subsp. lactis
C;Species: Lactococcus lactis subsp. lactis
C;Species: Lactococcus lactis subsp. lactis
C;Accession: H8689

R;Bolotin, A.; Wincker, P.; Mauger, S.; Jaillon, O.; Malarme, K.; Weissenbach, J.; Ehrli
Genome Res. 11, 731-753, 2001

A;Title: The complete genome sequence of the lactic acid bacterium Lactococcus lactis ss
A;Reference number: A86625; MUD:21235186; PMID:11337471

A;Reference number: A86625; MUD:21235186; PMID:11337471

A;Reference number: A86625; MUD:21235186; PMID:11337471

A;Reference number: A86625; MUD:21235186; PMID:11337471

A;Residues: 1-446 <STO>
A;Cross-references: GB:AE05176; PID:g12725265; PIDN:AAK06298.1; GSPDB:GN00146
A;Experimental source: strain IL1403
C;Genetics:
A;Gene: Glamate-ammonia ligase
C;Keywords: ligase
                                                                                                                                                                              112
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                                         220 KPVVKRIALEHGLLASPLPKPIAGVSGSGMHCHLSLFKDGQ---NVFDDPGGEHGLSDTA
                                                                                                                                    RNWIAGLLKYVPEATYFFASYINSYKRLQPLTFAPTKCCWAIDNRTSAFRLCNSKSEGIN
                                                                                                                                                                                                                                                                        349 VELRIGGADLNPYLAFSAIIAAGISGIEEKLELPPPASGNVY-----NDKELPEFPNS
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| SFIAGLLKHAYNFTAITNPTVNSYKRLVPGYEAÞVYVAWAGRNÄSPLIRVPASRGLSTRV
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   KHGVREMAEQSGWVATFMAKLSSTALGNACHIHMSL-QDAETEKNAFYDQNDEYGMSTLA
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                                                  EGIAGGGYEISSVDTGYSDCHLCADLNSLHLLPWS-EGAVLAISNPHNFVTSEPLFCSPR
                                                                                                                                                                                                                                                                    169 HQWMNISASSGIETFWRSVRNKLEEAGILMEATHPEFLPSQHELNFVPADPLTMADRHII
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                                                          Fitle: Complete genome sequence of Peeudomonas aeruginosa PA01, an opportunistic pathorence number: A82950; MUD:20437337; PMID:10984043
Accession: D383609
Status: preliminary
Molecule type: DNA
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K.; Lim,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ristover, C.K.; Pham, X.Q.; Erwin, A.L.; Mizoguchi, S.D.; Warrener, P.; Hickey, adman, S.; Yuan, Y.; Brody, L.L.; Coulter, S.N.; Folger, K.R.; Kas, A.; Larbig, L. L.; Lory, S.; Olson, M.V.
Nature 406, 959-964, 2000
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| ICPNVNSYRRFGSQFYVPNAPSWGLDNRTVALRVPTGSPDAVRLEHRVAGADANPYLLLA 370
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     131 NLKLKGLFASELEFNLFN-ETYKSASOKHWKNLKTAOPHHOWMNISASSGIETFMRSVRN 189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            190 KLEEA---GILMEATHPEFLPSQHELNF-VPADPLTMADRHIIAKHGVREMAEQSGMVAT 245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                306 FASYINSYKRLQPLTFAPTKCCWAIDNRTSAFRLCNSKSEGINVELRIGGADLNPYLAFS 365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                366 ALIAAGISGIEEKLELPPPASGNVYNDKELPEFPNSLQNATHLLKESKMLNKTFGEKLIL 425
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                                                                                                                                                                                                                                                                                                                               22 EVQFVDLLISDWAGVVRGKRIERNSLPKVFEKGINLPASLFALDITGSTVESTGLGLDIG
                                                                                                                                                                                                                                                                                                        16 KIDTVVLACVDMOGRLMGKRLTGRHFLGLDQKKISISTFVYAVTIEG----IAGGGYEIS
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18.9%; Score 450; DB 2; Length 452;
Best Local Similarity 28.4%; Pred. No. 9.5e-29;
Matches 130; Conservative 80; Mismatches 222; Indels 26;
                                                                                                                                                                                                                        ; Score 458; DB 2; Length 458; Pred. No. 2.1e-29; 85; Mismatches 211; Indels
A;Reference number: A82950; MUID:20437337; PMID:10984043
A;Accession: A83391
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Best Local Similarity 28.2%;
Matches 125; Conservative 8
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                       Accession: A83391; Status: preliminary
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GenCore version 5.1.6
Copyright (c) 1993 - 2003 Compugen Ltd.
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Listing first 45 summaries
                                                           - protein search, using sw model
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o_unclassified:*
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sp_mammal:*
sp_mar;
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sp_organelle:*
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Q9RX64	Q916J5	091275	Q8G4S3	Q8P897	QBDVU9	Q916J3	Q92RY1	Q8PY99	0976N5	Q9HI49	Q8PJQ2	QBEQP3	Q92MV2	Q8TYG1	QBDXT3	Q8EHF4	Q8TID7	Q98EM0	Q99Y41	Q8NZG4	Q8E3F3	60V760	097728	097586	овроже	Q9KAC9	Q988Z8	Q9RDS6	
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464.5	459	458	453	453	451	450	450	449.5	449.5	449	449	447.5	447.5	446.5	445	445	444.5	442	441	441	440	434.5	434	432	432	430	430	425.5	
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242 GKCITFMAKYDYARAGSSSHVHNSIWSADGKEPLFFDPKAPYTMTPLMRSWVAGQIKYAT 301
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                                           121 ILMOQIERLANLKLKGLFASELEFNLFNETYKSASQKHWKNLKTAQPHHQWMNISASSGI
                                                                 ETFMRSVRNKLEEAGILMEATHPEFLPSQHELNFVPADPLTMADRHIIAKHGVREMAEQS
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Boistard P., Becker A., Boutry M., Cadieu E., Dreano S., Gloux S.,
Godie T., Goffeau A., Rahn D., Kiss E., Lelaure V., Masuy D.,
Pohl T., Portetelle D., Puehler A., Purnelle B., Ramsperger U.,
Renard C., Thebault P., Vandenbol M., Weidner S., Galibert F.;
Sinorhizobium meliloti strain 1021.",
Proc. Natl. Acad. Sci. U.S.A. 98:9877-9882(2001).
InterPro; IPR001637; GINA ademyltn.
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01-DEC-2001 (TrEMBLrel. 19, Last sequence update)
01-DEC-2002 (TrEMBLrel. 19, Last annotation update)
101-OCT-2002 (TrEMBLrel. 22, Last annotation update)
Hypothetical protein R02213.
R02213 OR SMC01594.
Rhizobium meliloti (Sinorhizobium meliloti).
Bacteria; Proteobacteria; Alphaproteobacteria; Rhizobiales;
Rhizobiaceae; Sinorhizobium.
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SEQUENCE 454 AA; 51112 MW; B4265B789114D431 CRC64;
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43.7%; Pred. No. 2.1e-71;
ive 87; Mismatches 168;
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PD001057; GlnA adenyltn; 1.
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MEDLINE=21396507; Pubmed=11481430;
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Pfam; PF03951; gln-synt N
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STRAIN=1330 / Biovar 1;

STRAIN=1330 / Biovar 1;

MEDLINE=2224741; PubMed=12271122;

Paulsen I.T., Seshadri R., Nelson K.E., Eisen J.A., Heidelberg J.F.,

Paulsen I.T., Seshadri R., Durkin A.S., Kolonay J.F., Madupu R.,

Daugherty S.C., Deboy R.T., Durkin A.S., Kolonay J.F., Madupu R.,

Nelson W.C., Ayodeji B., Kraul M., Shetty J., Malek J., Van Aken S.E.,

Riedmuller S., Tettelin H., Gill S.R., White O., Salzberg S.L.,

Hoover D.L., Lindler L.E., Halling S.M., Boyle S.M., Fraser C.M.;

"The Brucella suis genome reveals fundamental similarities between animal and plant pathogens and symbionts.";

Proc. Natl. Acad. Sci. U.S.A. 99:13148-13153(2002).
                                                                                                                                    QQIERLANLKLKGLFASELEFNLFNETYKSASQKHWKNLKTAQPHHQWMNISASSGIETF
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ILMQQIERLANLKLKGLFASELEFNLFNETYKSASQKHWKNLKTAQPHHQWMNISASSGI
                            || :|: || : | || :| || || || || || ::| | :: :| :: :| :: :| ILKKQVARLEAMGFKAYMASELEFFLFDQSYDDARLSGYRDLQLASGYNEDYHIFQTTKE
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01-JUN-2002 (TrEMBLrel. 21, Last sequence update)
01-JUN-2002 (TrEMBLrel. 23, Last sequence update)
01-JUN-2003 (TrEMBLrel. 23, Last annotation update)
01 tranine syntherasel (31,000 or Age Cana Or Agrobacterium tumefaciens (strain C58 / ATCC 33970).

Bacteria: Proteobacteria; Alphaproteobacteria; Rhizobiales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EKLILHYVNAANVEINEFSKOVTDWELNOGFNR 453
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ProDom; PD001057; GlnA_adenyltn; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Science 294:2317-2323(2001).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Rhizobiaceae; Rhizobium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NCBI_TaxID=176299;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.
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                                                                                                                   63
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STRAIN=16M / ATCC 23456 / Biotype 1;

MEDLINE=20020109; PubMed=1175668;

DelVecchio V.G., Kapatral V., Redkar R.J., Patra G., Mujer C., Los T.,

Ivanova N., Anderson I., Bhattacharvya A., Lykidis A., Reznik G.,

Jablonski L., Larsen N., D'Souza M., Bernal A., Mazur M., Goltsman E.,

Selkov E., Blzer P.H., Hagius S., O'Callaghan D., Letesson J.-J.,

Haselkorn R., Kyrpides N., Overbeek R.;

The genome sequence of the facultative intracellular pathogen

Brucella melitensis.
                                                                                                                                                                                                                       65 TVPGYKSSSWEKGYGDYTLKPDLSTLRKVPWLECTALVLCDVLDHHTHEEVPHSPRALLK
                                                                                                                                                                                                                                                                                                                                                                                  124 QQIERLANLKLKGLFASELEFNLFNETYKSASQKHWKNLKTAQPHHQMMNISASSGIETF
                                                                                                                                                                                                                                                                                                   244 ATEWAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLARNWIAGLLKYVPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4 TYDELNNLIRNGKIDTVVLACVDMQGRLMGKRLTGRHFLGLDQKKISISTFVYAVTIEGI
                                                                                                                                                       5 TFDALKMDVABGRIDTVLACLVDMQGRLMGKRFQABFFVESAFBETHSCNYVLATDMEME
                                                                                                                                                                                                  64 AGGGYEISSVDTGYSDCHLCADLNSLHLLPWSEGAVLAISNPHNFVTSEPLFCSPRVILM
                                                                                                                                                                                                                                                                                                                                                           184 MRSVRNKLEEAGILMEATHPEFLPSQHELNFVPADPLTMADRHIIAKHGVREMAEQSGMV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             245 VIFLAKWNYNAAGSSSHIHQSLWSLD-GKPAFLDKDGEHGMSDVMRHYVAGLLAHASDIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      YFFASYINSYKRLQPLTFAPTKCCWAIDNRTSAFRLCNSKSEGINVELRIGGADLNPYLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     364 FSAIIAAGISGIEEKLELPPPASGNVYNDKELPEFPNSLQNATHLLKESKMLNKTFGEKL
                                                                                Gaps
                                                                              1;
                                     Length 454;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Brucella melitensis.
Bacteria; Proteobacteria; Alphaproteobacteria; Rhizobiales;
Brucellaceae; Brucella.
                                                                            89; Mismatches 165; Indels
50703 MW; 559465BB5613E37E CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               49582 MW; 1114E54225746C7A CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 01-MAR-2002 (TrEMBLrel. 20, Created)
01-MAR-2002 (TrEMBLrel. 20, Last sequence update)
01-OCT-2002-(TrEMBLrel:-22,-Last_annotation update)
(Glittamine_synthetase %(EC:6:3-1:2))
                                                         Pred. No. 1.1e-69;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Proc. Natl. Acad. Sci. U.S.A. 99:443-448(2002)
EMBL, AE009691, AAL53796.1; -.
InterPro, IPR001637; GlnA_adenyltn.
InterPro, IPR001691; GLN_synth.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 424 ILHYVNAANVEINEFSKQVTDWELNQGFNR 453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 942.5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pfam; PF00120; Qln-synt; 1.
Pfam; PF03951; gln-synt; 1.
Pr050m; PD001057; gln-synt N; 1.
Ligase; Complete proteome.
SEQUENCE 434 AA; 49582 MW; 1114F
                                   39.7%;
                                                                            Matches 195; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRELIMINARY;
454 AA;
                                                         Similarity
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299 VPEATYFFASYINSYKRLQPLTFAPTKCCWAIDNRTSAFRLCNSKSEGINVELRIGGADL 358
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 185 RMEPLIKDIRLGMAGAGLRFEAVKGECNMGQQEIGFRYDEALVTCDNHAIYKNGAKEIAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      IMQQIERLANLKIKGL---FASELEPNLPNETYKSASQKHWKNLKTAQPHHQWMNISASS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             179 GIETFMRSVRNKLEEAGILMEATHPEFLPSQHELNFVPADPLTMADRHIIAKHGVREMAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QSGMVATFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLARNWIAGLLKY
                                                                                                                                                                                                                                                                                                                                                                                                                             3 ITYDELNNLIRNGKIDTVVLACVDMQGRLMGKRLTGRHFL-GLDQKKISISTFVYAVTIE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  62 GIAGGGYEISSVDTGYSDCHLCADLNSLHLLPWSEGAVLAISNPHNFVTSEPLFCSPRVI
                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                  L-GLUTAMATE + NH(3) = ADP + GLUTAMINE
              genome comparison of Mycobacterium tuberculosis clinical
                                                                                                                                                                                                                                                                                                                                                                                            11,
                                                                                                                                                                                                                                                                                                                                                         .5; DB 16; Length 457;
8e-58;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Streptomyces coelicolor.
Bacteria; Actinobacteria; Actinobacteridae; Actinomycetales;
Streptomycineae; Streptomycetaceae; Streptomyces.
                                                                                                      GLUTAMINE SYNTHETASE FAMILY
                                                                                                                                                                                                                                                                                                                                                       ; Score 799.5; DB 16; Length
; Pred. No. 8e-58;
88; Mismatches 180; Indels
                                                  databases.
                                                                                                                                                                                                                                             Pfam; PF00120; gln-synt; 1.
Pfam; PF03951; gln-synt, N: 1.
Probom: PD001057; GlnA adenyltn; 1.
Hypothetical protein; Ligase; Complete proteome.
SEQUENCE 457 AA; 49747 MW; 735F57E27C615F23 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-NOV-1998 (TrEMBLrel. 08, Created)
01-NOV-1998 (TrEMBLrel. 08, Last sequence update)
01-NAR-2003 (TrEMBLrel. 23, Last annotation update)
Putative glutamine synthetase (EC 6.3.1.2).
SCO1613 OR SCI35.35C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      laboratory strains.";
Submitted (APR-2001) to the EMBL/GenBank/DDBJ
-!- CATALYTIC ACTIVITY: ATP + L-GLUTAMATE + NH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FGEKLILHYVNAANVEINEFSKQVTDWELNQGFNR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              462 AA
                                                                                                                                                                        TIGR; MT2928; -.
TubercuList; Rv2860c; -.
InterPro; IPR001637; GlnA_adenyltn.
InterPro; IPR001691; Gln synth.
                                                                                   ORTHOPHOSPHATE.
-!- SIMILARITY: BELONGS TO THE BENEL; ALO08883; CAA15522.1; -- EMBL; AE007117; AAK47253.1; -- HSSP; PO6201; ILGR.
                                                                                                                                                                                                                                                                                                                                                          33.6%;
                                                                                                                                                                                                                                                                                                                                                                         Best Local Similarity 38.7
Matches 176; Conservative
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                  "Whole
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088070
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STRAIN=CDC 1551 / Oshkosh;
STRAIN=CDC 1551 / Oshkosh;
Fleischmann R.D., Alland D., Eisen J.A., Carpenter L., White O.,
Peterson J., DeBoy R., Dodoon R., Gwinn M.L., Haft D., Hickey E.,
Kolonay J.F., Nelson W.C., Umayam L.A., Ermolaeva M.D., Salzberg S.L.,
Delcher A., Utterback T., Weidman J., Khouri H., Gill J., Mikula A.,
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                                                                                                                                                                                                                                                                                                                                                                                              SHVHNSIWSADGKEPLFFDPKAPYTMTPLMRSWVAGQIKYATDYTYFLAPYINSYKRPQ
                                                                                       21 VLAC-VDMQGRLMGKRLTGRHFLGLDQKKISISTFVYAVTIEGIAGGGYEISSVDTGYSD
                                                                                                           FASELEFNLFNETYKSASQKHWKNLKTAQPHHQWMNISASSGIETFMRSVRNKLEEAGIL
                                                                                                                                                                                                                                                                                                      MEATHPEFLPSQHELNFVPADPLTMADRHI IAKHGVREMAEQSGMVATFMAKLSSTALGN
                                                                                                                                                                                                                                                                                                                         ACHIHMSLODAETEKNAFYDONDEYGMSTLARNWIAGLLKYVPEATYFFASYINSYKRLO
                                                                                                                                                                                                                                                                                                                                                                                                                                                  PLTFAPTKCCWAIDNRTSAFRLCNSKSEGINVELRIGGADLNPYLAFSAIIAAGISGIEE
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                                                  Gape
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01-JAN-1998 (TrEMBLrel. 05, Last sequence update)
01-OTA-2002 (TrEMBLrel. 22, Last annotation update)
Hypochetical 49.7 Kba protein (Glutamine synthetase, putative)
GLNA4 OR RV2860C OR MTV003.06C OR MT2928.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Bacteria; Actinobacteria; Actinobacteridae; Actinomycetales;
Corynebacterineae; Mycobacteriaceae; Mycobacterium.
NCBI TaxID=1773;
                  Length 434;
              39.0%; Score 927; DB 16; Length 4 43.9%; Pred. No. 1.9e-68; ive 78; Mismatches 161; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     457 AA.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDLINE=98295987; PubMed=9634230;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mycobacterium tuberculosis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FSKQVTDWELNQGFNRY
                                                   Matches 192; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRELIMINARY;
                Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRAIN=H37RV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              418
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   240 IAAKHGMTATFWAKPSAEWSGSSGHVHMSLSDLAGTP--VFANPENPGALSEVGYNFLAG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         de Azevedo Waesch S.I., van der Ploeg J.R., Kiener A., Leisinger T., "Degradation of isopropylamine by Pseudomonas species KIE171."; submitted (MAY-2001) to the EMBL/GenBank/DDBJ databases.-i- CATALYTIC ACTIVITY: ATP + L-GLUTAMATE + NH(3) = ADP + PHOSPHATE
                                                                                                                                                                                                                                                                                                                                                                                                                                                Bacteria; Proteobacteria; Gammaproteobacteria; Pseudomonadales;
Pseudomonadaceae; Pseudomonas.
NCBI_TaxID=159091;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB 2; Length 459;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -1- SIMILARITY: BELONGS TO THE GLUTAMINE SYNTHETASE FAMILY EMBL; AJ311159; CAC81335.1; -. HSSP; P06201; 2GLS.
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;; Pred. No. 1.9e-42;
73; Mismatches 194; Indels
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                                                                                                                                                                                                                                                                               01-DEC-2001 (TrEMBLrel. 19, Created)
01-DEC-2001 (TrEMBLrel. 19, Last sequence update)
01-DEC-2003 (TrEMBLrel. 23, Last annotation update)
Gamma-glutamylisopropylamide synthetase (EC 6.3.1.2)
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                                                                                                    422 KLILHYVNAANVEINEFSKQVTDWELNQGFNR
                                                                                                                                                                                                                                                                                                                                                                            synthetase) (Glutamate--ammonia ligase).
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ProDom; PD001057; GlnA_adenyltn; 1.
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InterPro; IPR001691; Gln synth.
Pfam; PF00120; gln-synt, 1.
Pfam; PF03951; gln-synt, N; 1.
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159; Conservative 7
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SEQUENCE
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Best Local S
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                                                                                                                                                                                                                                                                                                         for
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MEDLINE-21996410; PubMed=12000953;
Bentley S.D., Chater K.F., Cerdeno-Tarraga A.-M., Challis G.L.,
Thomson N.R., James K.D., Harris D.E., Quail M.A., Kieser H.,
Harper D., Bateman A., Brown S., Chandra G., Chen C.W., Collins M.,
Cronin A., Fraser A., Goble A., Hidalgo J., Hornsby T., Howarth S.,
Huang C.-H., Kieser T., Larke L., Murphy L., Oliver K., O'Neil S.,
Rabbinowitsch E., Rajandraam M.A., Rutherford K., Rutter S.,
Seeger K., Saunders D., Sharp S., Squares R., Squares S., Taylor K.,
Warren T., Wietzorrek A., Woodward J., Barrell B.G., Parkhill J.,
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-!- CATALYTIC ACTIVITY: ATP + L-GLUTAMATE + NH(3) = ADP + PHOSPHATE
                                                                                                                                                                                                                                                                                                         physical map
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        "Complete genome sequence of the model actinomycete Streptomyces coelicolor {\rm A3}\,(2) ,",
                                                                                                                                                                                                                               MEDLINE=97000351; PubMed=8843436; Redenbach M., Kieser H.M., Denapaite D., Eichner A., Cullum J., Kinashi H., Hopwood D.A.; Minashi H., Hopwood D.A.; As to fordered cosmids and a detailed genetic and physical mathe 8 Mb Streptomyces coelicolor A3(2) chromosome."; Mol. Microbiol. 21:77-96(1996).
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Oliver K., Harris D.;
Submitted (SEP-1998) to the EMBL/GenBank/DDBJ databases.
                                                                                                                B.G., Rajandream M.A.;
to the EMBL/GenBank/DDBJ databases.
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InterPro; IPR001691; GLN_synth.
Pfam; PF00120; gln-synt; 1.
Probom; PD001057; GlnA_adenyltn; 1.
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EMBL; AL939109; CAA20824.1;
HSSP; P06201; 1LGR.
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                                                                                        STRAIN=A3(2);
Parkhill J., Barrell
Submitted (SEP-1998)
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Gaps

31;

70

239

297

14.

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57 GKIMFDGSSI-TGFTPINQSDLYLQPDLTTFAVLPWTEEEGYSEGRFLCSVKKP----DG 111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           112 EPLFCSPRVILMOQIERLANLKLKGLFAS---ELEFNLFNETYKSASOKHWKNLKTAOPH 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               112 SDFEGDPRNILKKTVER----AKEKĞYSISVGPELEFFLFR-----TDEYGLPTKQTQDI 162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       169 HQWMNISASSGIETFMRSVRNKLEEAGILMEATHPEFLPSQHELNFVPADPLTMADRHII 228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           223 YKWVVTVAKQFGLHATFMPKPLGGANGSGMHTNISLFDDEKQENAFYDESDKLGLSKTA 282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      289 RNWIAGLLKYVPEATYFFASYINSYKRLOPLTFAPTKCCWAIDNRTSAFRLCNSKSEGIN 348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        349 VELRIGGADLINPYLAFSAIIAAGISGIEEKLELPPPASGNVYN-----DKELPEFPNS 401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      6 DELINNLIRNGKIDTVVLACVDMQGRLMGKRLTGRHFLGLDQKKISISTFVYAVTIEGIAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                16 EEIKETIKTKAVELLHLQFVDIEGIL--KHVT-2------VTAEQIDSVVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        229 AKHGVREMAEQSGMVATFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            66 GG--YEISSVDIGY----SDCHLCADLNSLHLLPW-----SEGAVL-AISNPHNFVTS
                                                                                                                                                                                                        "Complete genome sequence of the alkaliphilic bacterium Bacillus halodurans and genomic sequence comparison with Bacillus subtilis."; Nucleic Acids Res. 28:4317-4331(2000).
                                                                                                                                                           Masui N.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                57;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 16; Length 455;
                                                                                                                                                                                                                                                                       ORTHOPHOSPHATE.
-!- SIMILARITY: BELONGS TO THE GLUTAMINE SYNTHETASE FAMILY.
EMBL; AP001520; BAB07586.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              21.5%; Score 510.5; DB 16; Length
31.1%; Pred. No. 8.1e-34;
.ive 77; Mismatches 187; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  402 LONATHLLKESKMLNKTFGEKLILHYVNAANVEINEFSKQVTDWEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Bacillales; Bacillaceae; Bacillus
                                                                                                                                                  Takami H., Nakasone K., Takaki Y., Maeno G., Sasaki R. Puji F., Hirama C., Nakamura Y., Ogasawara N., Kuhara Horikoshi K.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  455 AA; 50463 MW; BB669371A49325F0 CRC64;
Last annotation update)
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                                                                                                                                                                                                                                                                                                              EMBL, ARVOLLS,
INTERPRO, IPRO04809, GlnA.
InterPro, IPR001697, GlnA. adenyltn.
InterPro, IPR001697, GlnA. adenyltn.
InterPro, IPR001691, GLN. synth.
                                                                                                                                                                                                                                                                                                                                                                                  Pfam; PF00120; gln-synt; 1.
Pfam; PF03951; gln-synt, N; 1.
Pr0Dom; PD001057; GlnA adenyltn; 1.
TIGRFAMS; TIGR00653; GlnA; 1.
PROSITE; PS00180; GLNA 1; 1.
PROSITE; PS00181; GLNA ATP; 1.
                                                                                                            SEQUENCE FROM N.A.
STRAIN=C-125 / JCM 9153;
MEDLINE=20512582; PubMed=11058132;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRT;
22,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Best_Local Similarity 31.1%
Matches 145; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ligase; Complete proteome
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                                                               Firmicutes;
                Glutamine synthetase
                                              Bacillus halodurans
                                                                            NCBI_TaxID=86665;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE
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Q9AEL4
ID Q9AEL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  232
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              71 DGLAFTGW-----DSGYPDIALIPDLLTLSLVPWQAKTASVLCDIQH-LNGQSLNLSPRN 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              --SSSSDI---IGEVRKYWRDAGIVLEATNSEHGPGQYEINIKYDDALKAADDAIFVKNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 7 ELNNLIRNGKIDTVVLACVDMQGRLMGKRLTGRHFL---GLDQKKISISTFVYAVT---I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EGIAGGGYEISSVDTGYSDCHLCADLNSLHLLPWSEGAVLAISNPHNFVTSEPLFCSPRV
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MEDINE-22113472; PubMed=12426155;
Larbig K.D., Christmann A., Johann A., Klockgether J., Hartsch T.,
Merkl R., Wiehlmann L., Fritz H.J., Tummler B.;
"Gene Islands Integrated into tRNA(Gly) Genes Confer Genome Diversity
on a Pseudomonas aeruginosa Clone.";
J. Bacteriol. 184:665-6680(2002).
SEQUENCE 460 AA; 50620 MW; 35FD0D472764D446 CRC64;
                                                                                                                                                                                                                          Pseudomonas aeruginosa.
Bacteria; Proteobacteria; Gammaproteobacteria; Pseudomonadales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 25.0%; Score 595; DB 2; Length 460; llarity 33.6%; Pred. No. 7.8e-41; Conservative 80; Mismatches 191; Indels
                                                                                                                                        01-MAR-2003 (TrEMBLrel. 23, Created)
01-MAR-2003 (TrEMBLrel. 23, Last sequence update)
01-MAR-2003 (TrEMBLrel. 23, Last annotation update)
                    ||:| : | : : | | : : | | | ESEMARVIFPNEFVEHYAQMKVWEIKQSNSFVNNWEL 452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FRESEMARULFPKEFVEHYSOMKVWEIKQANGFVNNWEL
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                                                                                                                                                                                          Putative glutamine-synthetase
                                                                                                                                                                                                                                                        Pseudomonadaceae; Pseudomonas
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Q9K665;
01-OCT-2000 (TrEMBLrel. 15,
01-OCT-2000 (TrEMBLrel. 15,
                                                                                                            PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Best Local Similarity
Matches 154; Conserv
                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                       NCBI_TaxID=287;
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Gapa

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01-OCT-2002 (TrEMBLrel, 22, Created)
01-OCT-2002 (TrEMBLrel, 22, Last sequence update)
01-OCT-2002 (TrEMBLrel, 22, Last annotation update)
Glutamine synthase (EC 6.3.1.2).
                                                                                                                       SEQUENCE FROM N.A.
STRAIN=ATCC 13032 / DSM 20300 / NCIB 10025;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LAFSAIIAAGISGIEEKLELPPPASGNV----
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                                                                                                                                                                                                                                                                                             19.8%;
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                                                                                                                                                                                                                                                                                                                      Matches 134; Conservative
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01-MAR-2003 (TrEMBLrel.
01-MAR-2003 (TrEMBLrel.
                                                                                                                                                                                                                                                                                                          Similarity
                                                                                                                                               Nakagawa S.;
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                                                                                                                                                                                                                                                                     SEQUENCE
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Best Local (
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           131 NLKLKGLFASELEFNLFNETYKSASQKHWKNLKT-----AQPHHQWMNISASSGIETFM 184
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        269 VINQWVNSYKRIVYGNEAPTAATWGVSNRSALVRVPTYRLNKEESRRVEVRLPDTACNPY 328
                                                                                                                                                                                                                                                                                                                                                                                                                                             74
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                                                                                                                                                                                                                                                                                                                                                                                                                                                            TGYSDCHLCADLNSLHLLPWSEG-AVLAISNPHNFVT---SEPLFCSPRVILMQQIERLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | | : :|| | : || T----IARPDPSTFQVLPLEAGISKLQAARLFCDVTMPDGQPSFSDPRQVLRRQVQLAA
                                                                                                                                                     RSVRNKLEEAGILMEATHPEFLPSQHELNFVPADPLTMADRHIIAKHGVREMAEQSGMVA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         305 FFASYINSYKRLQPLTFAPTKCCWAIDNRTSAFRLCN---SKSEGINVELRIGGADLNPY
                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                     71;
                                                                                                                                                                                                                                                                                                                                                                                             DB 2; Length 427;
                                                                                 Corynebacterium glutamicum (Brevibacterium flavum).
Bacteria; Actinobacteria; Actinobacteridae; Actinomycetales;
Corynebacterineae; Corynebacteriaceae; Corynebacterium.
                                                                                                                                                                                                                                                   -1- SIMILARITY:
EMBL, AJ310086; CAC34378.1; -
EMBL, AJ310086; CAC34378.1; -
EMBL, AJ310086; CAC34378.1; -
EMBL, AJ310086; CAC34378.1; -
InterPro; IDRO1637; GlnA adenyltn.
InterPro; IPR001637; GlnA synth.
Pfam; PF00120; Gln-Synt; 1.
Pfam; PF003951; Gln-Synt; 1.
ProDom; PF003951; GlnA_adenyltn; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
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          01-JUN-2001 (TrEMBLrel. 17, Created)
01-JUN-2001 (TrEMBLrel. 17, Last sequence update)
01-CCT-2002 (TrEMBLrel. 22, Last annotation update)
Glutamine synthetase 2 (EC 6.3.1.2) (Glutamate-ammonia
                                                                                                                                                                                                                                                                                                                                                                   427 AA; 48146 MW; CE5326A81A2406F6 CRC64;
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EKSELVADILGEHVFEFFLRNKWREWRDYQEQITPWELRNNLD
                                                                                                                                                                                                                                                                                                                                                                                           19.8%; Score 470.5; DB 2; 28.9%; Pred. No. 1.5e-30; ative 84; Mismatches 174;
                                                                                                                                                                                                                                                                                                                                                                                                        Best Local Similarity 28.99
Matches 134; Conservative
                                                                                                                                                                                                                                            L-GLUTAMINE.
                                                                                                                       NCBI_TaxID=1718;
                                                                                                                                                                                                                                                                                                                                                          Ligase.
SEQUENCE
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AC OB
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PRT;

PRELIMINARY:

QBNNH4; Q8NNH4

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| :| :| | :| :| T----IARPDPSTFQVLPLEAGISKLQAARLFCDVTMPDGQPSFSDPRQVLRRQVQLAA 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 348 LAFSVMLGAGLKGIKEGYELDEPAEDDISNLSFRERRAMGYND-----LPSSLDOALRQM 402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             131 NLKLKGLFASELEFNLFNETYKSASQKHWKNLKT-----AQPHHQWMNISASSGIETFM 184
                                                                                                                                                                                                                          "Complete genomic sequence of Corynebacterium glutamicum ATCC 13032."; Submitted (MAY-2002) to the EMBL/GenBank/DDBJ databases. EMBL; AR003281; BAB95622.1; -.. InterPro; IPR001631; GlnA_adenyltn. InterPro; IPR001691; Gln_adenyltn. Ffam; PF00120; gln-synt, 1. Pfam; PF00120; gln-synt, 1. Probom; P001057; GlnA_adenyltn; 1. Probom; P001057; GlnA_adenyltn; 1. Ligase; Complete protecome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DEGLICMISPEIEFYLV------QSLRINGLPPVPTDNGGYFDQAIFNEAPNFR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    15 GKIDTVVLACVDMQGRLMGKRLTGRHFLGLDQKKISISTFVYAVTIEGIAGGGYEISSVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GHLKSWWAPAELESAL-----EEGIGFD------GSAIEGYA----RISEAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              75 TGYSDCHLCADLNSLHLLPWSEG-AVLAISNPHNFVT---SEPLFCSPRVILMQQIERLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           185 RSVRNKLEEAGILMEATHPEFLPSQHELNFVPADPLTMADRHIIAKHGVREMAEQSGMVA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           245 TFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEYGMSTLARNWIAGLLKYVPEATY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   305 FFASYINSYKRLQPLTFAPTKCCWAIDNRTSAFRLCN---SKSEGINVELRIGGADLNPY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       288 VINOWVNSYKRIVYGNEAPTAATWGVSNRSALVRVPTYRLNKBESRRVEVRLPDTACNPY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              --- YNDKELPEFPNSLONATHLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        71;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 446;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Corynebacterium efficiens.
Bacteria; Actinobacteria; Actinobacteridae; Actinomycetales;
Corynebacterineae; Corynebacteriaceae; Corynebacterium.
Corynebacterium glutamicum (Brevibacterium flavum).
Bacteria; Actinobacteria; Actinobacteridae; Actinomycetales;
Corynebacterineae; Corynebacteriaceae; Corynebacterium.
NCBI_TaxID=1718;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           84; Mismatches 174; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KESKMLNKTFGEKLILHYVNAANVEINEFSKQVTDWELNQGFN 452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                446 AA; 50381 MW; 30E54AC65E3B2CF1 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                403 EKSELVADILGEHVFEFFLRNKWREWRDYGGQITPWELRNNLD
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Last annotation update)
6.3.1.2).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB 16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 470.5; DB 10
Pred. No. 1.6e-30;
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287 361 347 409

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S6 -----NTPRAFAICDAQELDGTPSGLSTRGLLKQVVARYAAHGLQPVVATELEFFVFA 108
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          263 MSLQDAETEKNAFYDQNDEYGMSTLARNWIAGLLKYVPEATYFFASYINSYKRLQPLTFA 322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PPASGNVYNDKELPE---FPNSLQNATHLLKESKMLNKTFGEKLILHYVNAANVEINEFS 439
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
STRAIN=16M / ATCC 21456 / Biotype 1;
MEDLINE=20020109; PubMed=11756688;
DelVecchio V.G., Kapatral V., Redkar R.J., Patra G., Mujer C., Los T.,
Ivanova N., Anderson I., Bhattacharyya A., Lykidis A., Reznik G.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         148 ----NETYKSASQKHWKNLKTAQPHHQWMNISASSGIETFMRSVRNKLEEAGILMEATH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         165 HEMGTSQPEINFLHGDPVLLADQTFLFKHLLKEVALKHGLIVVCMAKPLAKTPGSSMHIH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     225 QSIVELDGGRNIFSEADGE--PSAAFRHFIGGQACLADFTPFFAPHVNSFQRLCHPYAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           96 EGAVLAISNPHNFVTSE-----PLFCSPRVILMQQIERLANLKLKGLFASELEFNLF-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           109 PNTDPNEPFQAPLGPDGRR----ELGYSAFSVSSNNGLRPFFEDVYRCMDALGLVRDTFM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         203 PEFLPSOHELNFVPADPLTMADRHIIAKHGVREMAEQSGMVATFMAKLSSTALGNACHIH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   36 LIGRHFLGLDQKKISISTFVYAVTIEGIAGGGYEISSVDTGYSDCHLCADLNSLHLLPWS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PTKCCWAIDNRTSAFRLCNSKSEGINVELRIGGADLNPYLAFSAIIAAGISGIEEKLELP
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                                                                                                                     + GLUTAMINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                38;
                                                                                                                                                        ORTHOPHOSPHATE.
-1- SIMILARITY: BELONGS TO THE GLUTAMINE SYNTHETASE FAMILY.
EMBL, AEGO4788; AAGG6744.1; -.
HSSP; PG6201; 1LGR.
InterPro; IPR001637; GlnA adenyltn.
InterPro; IPR001691; GLN synth.
InterPro; IPR00215; Serpin.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Bacteria; Proteobacteria; Alphaproteobacteria; Rhizobiales;
Brucellaceae; Brucella.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                92; Mismatches 174; Indels
                                                                                                                         ADP
                                                                                                                                                                                                                                                                                                                                                                                                                                             Pfan; PF00120; gln-synt; 1.
Probom; PD001057; GlnA adenyltn; 1.
PROSITE; PS00284; SERPIN; 1.
Hypothetical protein; Ligase; Complete proteome.
SEOUENCE 413 AA; 45161 MW; 6989A0BF4122C375 CRC64;
    of Pseudomonas aeruginosa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Last sequence update)
                                                                                                            -!- CATALYTIC ACTIVITY: ATP + L-GLUTAMATE + NH(3)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 469; DB 16;
Pred. No. 1.9e-30;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  19.7%;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      01-MAR-2002 (TrEMBLrel. 20,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches 123; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRELIMINARY;
                                                                                  Nature 406:959-964 (2000)
                                       opportunistic pathogen.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KOVTDWE 446
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Best Local Similarity
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    12;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DTGYSDCHLCADLNSLHLLPWS-EGAVLAISNPHNFVT---SEPLFCSPRVILMQQIERL 129
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GKIDTVVLACVDMQGRLMGKRLTGRHFLGLDQKKISISTFVYAVTIEGIAGGGY-EISSV
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STRAIN=ATCC 15692 / PRO1;
MEDLINE=20437337; PubMed=10984043;
MEDLINE=20437337; PubMed=10984043;
MEDLINE=20437337; PubMed=10984043;
Stover C.K., Pham X.-0.T., Erwin A.L., Mizoguchi S.D., Warrener P., Hickey M.J., Brinkman F.S.L., Hufnagle W.O., Kowalik D.J., Lagrou M., Hickey M.J., Brinkman F.S.L., Hufnagle W.O., Kowalik D.J., Lagrou M., Garber R.L., Goltry L., Tolentino E., Westbrock-Wadman S., Yuan Y., Bridy L.L., Coulter S.N., Folger K.R., Kas A., Larbig K., Lin R.M., Smith K.A., Spencer D.H., Wong G.K.-S., Wu Z., Paulsen I.T., Reizer J., Saier M.H., Hancock R.B.W., Lory S., Olson M.V.;
                                                                                                                STRAIN=7S-314 / AJ 12310 / DSM 44549 / JCM 11189;
Kawarabayasi Y., Yamazaki J., Hino Y., Kikuchi H., Nakamura Y.,
Ikeo K., Suzuki M., Mashima J., Itoh T., Yamagishi A., Nishio Y.,
Usuda Y., Sugimoro S.;
"The entire genomic sequence of Corynebacterium efficiens YS-314.";
Submitted (MAX-2002) to the EMBL/GenBank/DDBJ databases.
EMBL, AP005221; BAC18937.1; -.
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Bacteria; Proteobacteria; Gammaproteobacteria; Pseudomonadales;
Pseudomonadaceae; Pseudomonas.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .5; DB 16; Length 516; 2e-30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match 19.8%; Score 470.5; DB 16; Length Best Local Similarity 29.2%; Pred. No. 2e-30; Matches 134; Conservative 85; Mismatches 167; Indels
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SEQUENCE 516 AA; 58460 MW; 398C2255E226DC28 CRC64;
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01-WAR-2001 (TrEMBLrel. 16, Last sequence update)
01-WAR-2003 (TrEMBLrel. 23, Last annotation update)
Hypothetical protein PA3356.
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NCBI_TaxID=152794;
                                                                                      FROM N.A.
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282

147

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A Jablonski L., Larsen N., D'Souza M., Bernal A., Mazur M., Goltsman E., Selkov E., Elzer P.H., Hagius S., O'Callaghan D., Letesson J.-J., Hagius S., O'Callaghan D., Letesson J.-J., Hagelkorn R., Kyrpides N., Overbeek R.; The genome sequence of the facultative intracellular pathogen Broc. Natl. Acad. Sci. U.S.A. 99:443-448(2002).

REMBL; AEOOS688; AALS3765.1; -.

REMBL; AEOOS688; AALS3765.1; -.

RITHERPO: IPRO01637; GlnA_synth.

Rempt. PF00351; gln-synt. 1.

Rempt. Probom; PD001057; GlnA_adenyltn: 1.

Rempt. Probom; PD001057; GlnA_adenyltn: 1.

Rept. Probom; PD001057; GlnA_adenyltn: 1.

Rept. Probom; PD001057; GlnA_adenyltn: 1.

Rept. Probom; PD001057; GlnA_adenyltn: 1.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  143 RNVLRNVIAAYSKRGLKPVVAPEIEFYLVR--------KNPDPDYPLTPPVGRS 188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               170 -----QWMNISASSGIETFWRSVRNKLEEAGILMEATHPEFLPSQHELNFVPADPLTM 222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            189 GRAIGGGQGYSIAGVNEFDELIDDIYHFSEGQGLEIDTLIHEEGAGQLEINLRHGDPVEL 248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            223 ADRHIIAKHGVREMAEQSGMVATFMAKLSSTALGNACHIHMSLQDAETEKNAFYDQNDEY 282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         283 GMSTLARNWIAGLLKYVPEATYFFASYINSYKRLQPLTFAPTKCCWAIDNRTSAFRLCNS 342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            343 KSEGINVELRIGGADLNPYLAFSAIIAAGISGIEEKLELPPPASGNVYNDKELPEFPNSL 402
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          62 GI---AGGGYEISSVDTGYSDCHLCADLNSLHLLPWSEGAVLAISNPHNFVTSEPLFCSP
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match 19.6%; Score 465; DB 16; Length 4. Best Local Similarity 28.7%; Pred. No. 5.2e-30; Matches 133; Conservative 71; Mismatches 208; Indels
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